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ABSTRACT

Findings are presented of a study begun in 1976 whose purpose was to examine the current and prospective application of management accounting in colleges and universities. The information was obtained through interviews, mail questionnaires and a literature search. The field study and mail survey were designed to serve as the fact-finding devices regarding current practices and also as the means of eliciting the participants' opinions and recommendations regarding possible improvements. The interviews were conducted mainly with business officers. The mail survey list included academic administrators and state-level planners as well. The report was written not only for the business officers, but also for all parties concerned with managerial problems encountered in higher education. The financial decision-making process in colleges and universities is related to the applicable management accounting approaches, both as they are used presently and as they might be used with respect to some typical unresolved problems. In this context, several techniques are discussed and illustrated, including the applicable techniques that have been successfully employed by business enterprises and the techniques that have been developed and implemented by some educational institutions. (Author/MSE)

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ED169868

Planning and Control in Higher Education

by

Anthony J. Gambino

National Association of Accountants

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Foreword

This report presents the findings of a study whose purpose was to examine the current and prospective application of management accounting in colleges and universities. The information was obtained through interviews, mail questionnaires and a literature search. The field study and mail survey were designed to serve as the fact-finding devices regarding current practices and also as the means of eliciting the participants' opinions and recommendations regarding possible improvements.

The interviews were conducted mainly with business officers. The mail survey list included academic administrators and state-level planners as well. In the same vein, the report was written not only for the business officers, but also for all parties concerned with managerial problems encountered in higher education.

The financial decision-making process in colleges and universities is related to the applicable management accounting approaches, both as they are used presently and as they might be used with respect to some typical unresolved problems. In this context, several techniques are discussed and illustrated. This includes the applicable techniques that have been successfully employed by business enterprises and the techniques that have been developed and implemented by some educational institutions.

Guidance in the preparation of this publication was kindly and generously provided by the Project Committee:

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This report reflects the views of the researcher and not necessarily those of the Association, the Committee on Research or the Project Committee.

Stephen Landekich
Research Director
National Association of
Accountants

Acknowledgments

This research monograph presents the results of a study which began in early 1976. The project initially was designed to broadly examine management accounting practices for nonprofit organizations. A pilot study indicated, however, that research would be facilitated and the findings would be of greater import if the scope were limited to institutions of higher education.

The author is deeply indebted to the many college administrators and state-level planners who participated in the interviews and mail survey. Their generous cooperation and input are graciously acknowledged. A number of other organizations and individuals in the higher educational community, too numerous to mention, were very helpful during the project. In particular, I would like to thank the National Association of College and University Business Officers (NACUBO) and the National Center for Higher Education Management Systems (NCHEMS) for their assistance and permission to quote from many of their publications.

Special thanks are extended to NAA's Research Director and my boss, Stephen Landekich, for his valuable direction, advice and support. The contributions made by the Project Committee, particularly the Chairman, Hadley Schaefer, are sincerely appreciated.

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Chapter 1

Introduction

The Higher Education Environment

The environment and management problems of colleges and universities differ from those of industrial firms. Higher education is labor intensive — its labor force is highly trained, and skills obtained are not readily transferable.

Two related factors that make higher education distinctive are academic freedom and faculty tenure. Traditionally, one primary function of a university is providing a forum for free discussion of ideas. It is asserted that open and free expression by faculty members should not be inhibited or restricted by external forces or threats of censure. Thus, the policy of faculty tenure has developed.

The other important distinction is the participation of faculty members in the government of a college or university. This participation takes many forms, such as faculty members serving on policy-making bodies and as academic administrators.

Colleges and universities want to render services to society. Their performance is measured by the breadth and quality of these services. Many of the inputs and outputs in the educational process are not readily measurable, however, so the input-output relationship is not well understood by the public. These measurement problems inhibit performance evaluation and effective management of institutions.

These and other problems inherent in higher education will be discussed throughout this report. This project was designed to investigate the current techniques used in the planning and control of colleges and universities and how they might be improved.

Overview of Research

The research for this project was conducted in three phases: survey of the literature, interviews, and mail survey.

Survey of the Literature

Although there is a great deal of published literature on the subject of financial accounting and reporting for colleges and universities, little deals with managerial accounting concepts. There is, however, a rich source of unpublished literature.

In his research, the author found, in a number of diverse sources, articles dealing with management accounting for higher education. They appeared in such magazines as *Management Accounting, Managerial Planning, AACSB Bulletin, Review of Educational Research,* and the now defunct *College and University Business.*

The National Association of College and University Business Officers (NACUBO) publishes a *Professional File* that is a series of occasional papers, some of which are related to management accounting in higher education. Another source is a series of *New Directions Sourcebooks* published by Jossey-Bass. Included are *New Directions for Higher Education, New Directions for Community Colleges,* and *New Directions for Institutional Research.* Each is issued quarterly and contains an edited collection of articles on a specific subject.

Most of the professional organizations in higher education issue some form of journal or newsletter. Although they generally do not deal with management accounting, one exception is the journal of the Society for College and University Planning, *Planning for Higher Education.* It is published bimonthly in loose-leaf form and contains short articles that deal with various aspects of planning for colleges and universities.

Besides *Professional File,* NACUBO issues the loose-leaf *College and University Business Administration — Administrative Service* that contains guidelines in the areas of administrative management, business management, fiscal management, and financial accounting and reporting. NACUBO also has published other works in the field of management accounting, some which will be discussed in the chapters on costing and planning.

A portion of the literature consists of published and unpublished monographs reporting the results of research projects sponsored by the federal government, universities and foundations. Many of these projects were conducted by the National Center for Higher Education Management Systems (NCHEMS), whose work is discussed throughout the report.

The author identified additional sources through the Educational Resource Information Center (ERIC) Clearing Houses, which is sponsored by the National Institute of Education. ERIC mainly collects unpublished documents dealing with all aspects of education, such as

papers, research reports and doctoral dissertations. Most of these are reproduced on microfiche and are available from ERIC in hard copy as well. ERIC publishes the monthly *Research in Education* (RIE), which contains abstracts of all reports collected by the ERIC Clearing Houses, and produces the *Current Index to Journals in Education* (CIJE), which indexes articles published in over 700 educational journals.

Results of the literature survey are presented throughout Chapters 3-6 in conjunction with some of the findings of the interviews.

Interviews

The author conducted interviews with financial administrators at 16 U.S. colleges and universities. The group included business officers of these institutions — the counterparts of treasurers or controllers in private firms — and some of their staff members. In several instances, members of the Office of Institutional Research were queried. These colleges and universities represented a cross section of institutions of different size and control, with varying proportions of graduate to undergraduate work and variable teaching/research balance. Thus, the findings are illustrative of the management needs and problems encountered in higher education.

The objectives of the interviews were:

- To examine the financial decision-making processes and information systems presently in use at colleges and universities;
- To identify unresolved management problems and to determine how management accounting techniques might contribute to their solution;
- To reveal new developments and techniques of university management and examine their applicability to other institutions;
- To assess to what degree differences in such factors as size, control, goals, and the like, affect the decision-making process;
- To gather information for the design of the mail survey and other aspects of the study.

The respondents expressed strong feelings that costing, budgeting and performance evaluation should be improved. The mail survey and the final report, therefore, give considerable attention to these areas.

The interview results showed that relatively few innovative management techniques were used. Those that *were* found were developed by the larger institutions in the sample. Larger institutions with greater resources were more involved in the development and implementation of advanced management systems, according to study results.

In an effort to identify innovative management techniques, the literature search was expanded and an open-ended questionnaire was directed to the larger institutions in the sample. The mail survey solicited ideas and suggestions for the improvement of the financial management of higher education. During the interviews it became apparent that academic administrators play an important role in the financial decision-making process. Thus, they, as well as an interested outside group, were included in the mail survey.

Mail Survey

The mail survey involved two questionnaires sent to three groups. An identical questionnaire was sent to both the chief academic and financial administrators within the same institution. The purpose of this procedure was to identify any serious conflicts between these two groups. A similar questionnaire was directed to state-level planners in each of the 50 states in order to obtain some input from outside the institution.

The institutions in the survey sample were those universities that offered doctoral programs in accounting and which were listed in the October 1974 *Journal of Accountancy*. Generally, this sample excluded small and medium-size colleges. This sampling procedure was intended to yield a more substantial amount of material relevant to the objectives of the study. The above source listed 63 schools. Six of these were participants in the interviews, while the remaining 57 comprised the sample for the mail survey. Names of the administrators were taken from the *Education Directory: Colleges and Universities,* published by the National Center for Education Statistics.

State-level planners were those directors of state post-secondary agencies who were also designated as being members of State Higher Education Executive Officers (SHEEO). SHEEO is an organization active in budgeting and planning on the state level. The *Education Directory* listed the name of the member for each state.

All questions were open-ended and required essay-type answers, which made the questionnaire more difficult to complete, but which obtained more meaningful replies. To encourage responses, the number of questions was held to a minimum.

The first question asked administrators requested the respondents'

views on the use of costing information in the decision-making process. The second solicited recommendations of how the budget process might be improved. The third and fourth questions were concerned with PPBS and outcome measures in higher education, respectively.

The initial query to the planners was designed to accumulate information about the states' experiences with PPBS, while the second asked for the types of costing data required by the states. The third question dealt with outcome measures.

Both the rate of response and the quality of most of the responses were indicative of the high interest in the subject. (The actual rates of response are presented in Chapter 2.) Because this was a relatively small sample, and the questionnaire was not statistical, very little attempt was made in the analysis to indicate the rate of responses to the different questions. Rather than trying to assess prevalence of the views, the author wanted to gather a variety of ideas and views. Thus, the analysis summarizes these views and presents a number of the more relevant comments and suggestions that were made. The analysis of the responses also is presented in Chapter 2.

Report Contents

The next chapter contains a detailed analysis of the questionnaire responses, while the rest of the report discusses the findings of the interviews in conjunction with the results of the literature search. A brief overview of the contents of the report follows.

Chapter Two: Analysis of Questionnaire Responses

Although the questionnaire phase was conducted last, the analysis of its results is presented first. The chapter serves as a background for the remainder of the report. Most of the contrasting views of the respondents are presented in this analysis, with many of their comments and suggestions.

Chapter Three: Costing Concepts for Higher Education

This chapter examines some of the problems in determining costs at colleges and universities. The current development and use of full costing data are discussed, as are the concepts of standard costs and variable costs and their potential relevance to higher education.

Chapter Four: Planning and Budgeting in Higher Education

A complete budget cycle at a college or university is illustrated here. In addition, the uses of Management Information Systems and simulation models by institutions of higher education are discussed in this chapter.

Chapter Five: PPBS and Zero-Base Budgeting

The first half of this chapter on Planning, Programming, Budgeting Systems (PPBS) contains background information necessary for the reader to understand this concept. In addition, the author discusses seven steps for the implementation of PPBS in higher education. The second part, on Zero-Base Budgeting, explains this concept as well as a university's experience with it.

Chapter Six: Accountability in Higher Education

This chapter discusses how colleges and universities might increase their accountability. The concept of outcome measures is examined as is the subject of performance evaluation in higher education.

Chapter 2

Analysis of Questionnaire Responses

The design of the questionnaire and the methods used in selecting the sample and analyzing the replies were described in the previous chapter. Again, because this was not a statistical survey, very little attempt was made to indicate the rates of responses to different questions. Instead, the various conflicting views are summarized. This chapter contains an analysis of the responses together with the comments and suggestions made by the respondents.

Rate of Response

The number of questionnaires mailed to and responses received from the three groups surveyed are indicated below:

	No. Mailed	No. Responses	Rate of Responses
Academic Administrators	57	19	33%
Financial Administrators	57	16	28%
State-Level Planners	50	31	62%

Of the 19 responses received from academic deans, 16 were employed in the analysis, and 14 of the 16 business officers' replies were usable, as were all of the responses from the planners.

Costing

In the course of reviewing the literature and interviewing financial administrators, the author frequently encountered the comment that many individuals in higher education, particularly in the academic community, questioned the usefulness of costs in the decision-making process. Some interview respondents indicated that this group felt that if decisions at a college or university were made using costing data as

the primary basis, the quality of that institution ultimately would suffer.

One question asked of both academic and financial administrators was intended to test how widespread this feeling was. A related question put to state-level planners was designed to determine the types of cost data required by the various states. The responses of the college administrators will be discussed together, followed by those of the state-level planners.

Administrators

The first question asked of both the academic and financial administrators was:

> *Do you feel that cost information would be a useful input to the decision-making process at colleges and universities?*
>
> *Yes*____ *No*____
>
> *If* yes, *describe the type of cost information (e.g., instructional costs/SCH, etc.) and how it might be most effectively used (e.g., comparison with prior year, etc.). If* no, *why not?*

Somewhat surprisingly, the responses to this question indicated small differences of opinion between the two groups of administrators. All the respondents, except one academic dean and one business officer, indicated that they felt costing information was a useful input to the decision-making process. Two academic deans who answered affirmatively, however, indicated that they had some serious qualifications. Both replies are reproduced below in their entirety:

> The yes is a qualified one. (1) Cost information is not costless to obtain. The benefit from improved decision making should exceed the cost of obtaining the information. (2) The cost information should be appropriate for the decision-making process. Cost information for short-term budgetary allocations should be based on comparable data. (3) Cost information should be timely. Cost information based on actual accounting data frequently is outdated by the time it is ready for use.

> The question is not how to use cost information but how to produce it with any degree of accuracy in an institution of higher learning.

Only one of the two respondents who answered negatively indicated a reason. He felt that it was not useful ". . . given diversity in data collection approaches and categories. . . ."

Next, the types of data suggested by some of the remaining respondents will be discussed, followed by how they might be used.

Types

Although many different types of cost data were recommended, the one most frequently suggested was costs divided by student-credit hours (SCH) or full-time equivalents (FTE). The definitions of SCH and FTE differ among institutions. The lack of consistency in this denominator presents a serious problem to the more effective use of unit cost data in higher education and will be discussed further in Chapter 3.

Sometimes a respondent suggested that the numerator should be full costs or, more often, direct instructional costs. Others recommended that these measures should be calculated on the basis of programs rather than departments.

Several respondents said that the cost for a degree probably would be more meaningful than the cost per SCH. Others suggested that cost data should be used in conjunction with nonfinancial profile data and that they should be related to qualitative as well as quantitative measures.

Many respondents indicated it would be meaningful to accumulate indirect costs as well and relate them to a base. Such measures included indirect costs per FTE, plant and maintenance costs per FTE, and average support dollars per faculty member. Others suggested that the total of various indirect costs should be accumulated, which included the costs of the library, student services, research, financial aid, fuel and utility, dormitory and support services.

A financial administrator commented that the type of cost data should vary with the decision under consideration. One of the academic administrators said that average or unit cost which attempts to allocate overhead ordinarily is not useful. He indicated that marginal or variable costs probably would be more useful in decision making. Another academic dean suggested that standard costs might be a useful tool in higher education.

Uses

Perhaps the most frequently suggested use of this data was for comparison, within the same institution, with prior years. A number of respondents indicated that data should be used to make comparisons with other similar institutions as well. Other recommendations included use for the allocation of resources and the spotting of problem as well as growth areas. One academic dean suggested cost data should be an

input to evaluating efficiency, while several respondents concluded that to be most useful, costs should be related to outcomes or some measure of productivity.

A number of the respondents who answered the question affirmatively did comment that these data should be used with caution and that they could result in potentially harmful decisions if employed improperly. Several administrators indicated that they doubted the appropriateness of using cost data for making comparisons between institutions since each institution is different. Another suggested that too much reliance should not be placed on this data; rather, they should be used mainly to indicate trends and changes.

Planners

The second question put to state-level planners was:

What types of costing information (e.g., instructional cost/SCH, etc.) are required to be calculated by the public colleges and universities in your state? How is it used (e.g. funding purposes, etc.)?

Of the 31 usable responses from this group, all but seven indicated that their state required some type of cost data. Of these seven, two indicated that their state will be requiring this type of information in the near future.

Types

The types of cost data mentioned most frequently by far were costs per SCH or FTE. Yet, one respondent was very critical of the unit cost approach. In part, he said:

> Because of the differences in institutional objectives, missions and accounting methods, the cost per SCH or cost per student approach is discouraged as this may produce information that is inaccurate and misleading . . .

A number of respondents commented that cost information is being reported by programs using NCHEMS' Program Classification Structure or some other similarly structured methodology.

Quite a few respondents indicated that their states also require various measures of indirect costs. Some of these measures included support costs per FTE, the costs of the library, and the calculation of the cost per square foot for maintenance.

Uses

As could be expected, by far the major use of this information was for funding purposes. Although several planners commented that their states were in the process of implementing NCHEMS' full costs, one respondent was skeptical as to the use of full costs as a basis for appropriations. He stated that, ". . . whether such (full) costs can be used for funding remains to be seen." Unfortunately, he did not elaborate.

One planner commented that this information is used as input to the establishment of tuition levels at state institutions. Another said that it was used partially for the determination of enrollment increases and adjustments.

None of the planners indicated that his state is making use of variable or marginal costing data. One respondent, however, who noted that his state is working on a project to develop a new funding formula, attached a working paper to his response. This paper indicates that it is important to differentiate between the fixed and variable components of expenditures if this information is to be used for certain decision-making purposes. The paper indicated that:

> . . . the ability to make such a distinction (between fixed and variable components) is of major importance in the development of a formula since the new mechanism should be capable of funding programs which are (a) being initiated, (b) increasing in enrollment, (c) decreasing in enrollment, (d) being eliminated, and (e) of different enrollment levels between universities.

The paper further commented that the determination of a technique to break down fixed and variable costs is one of the most challenging aspects of the project. It is expected that the following three techniques will be evaluated:

(a) statistical analysis — the use of regression or other statistical techniques to estimate the fixed component
(b) structural analysis — a program-by-program subjective evaluation of the basic support necessary to offer a program
(c) organizational analysis — the consideration of which legal obligations the university has, such as tenure, which by default result in a minimum support level.

Budgeting

Two questions addressed to administrators dealt with the subject of budgeting in colleges and universities. One question asked if adminis-

trators felt that PPBS would be a useful tool in the management of institutions of higher learning. The second solicited suggestions as to how the budget process might be improved. Only one question on the subject was addressed to state-level planners, and it asked whether their states had attempted to implement PPBS and whether it had been worth the effort.

First the responses on PPBS by administrators and planners will be discussed, to be followed by the administrators' responses to the question on the improvement of the budget process.

PPBS

During the interviews, the author discovered that a great deal of effort was being expended to adopt PPBS techniques in higher education. At the same time, he found that a good portion of the individuals interviewed were strongly opposed to the concept. To test how widespread this opposition was, and the reasons for it, one survey question dealt with PPBS.

Administrators

The third question asked of both academic and financial administrators was:

> *A number of attempts have been made to establish a Planning, Programming, Budgeting System (PPBS); however, these attempts have generally failed. Do you believe that some form of PPBS, if properly implemented, would be a useful tool in the management of colleges and universities?*
>
> *Yes*____ *No*____
>
> *If* yes, *how would you suggest that PPBS be modified so as to become operational in a college environment? If* no, *why not?*

Of those administrators who responded, a majority of the academic deans thought that it would be a useful tool while a majority of the business officers thought it would not. Two respondents did not indicate a definite yes or no although they made the following comments:

> I can respond both yes and no. It is yes if full commitment exists from all . . . university and all sources of revenue. Otherwise, it is no. Individuals in the system determine its applicability . . .

> . . . Program Budgeting . . . is just one tool whose usefulness depends upon the skills of the users and the circumstances under which it is employed . . . I suspect many institutions routinely employ many elements or variants . . . in their decision-making process.

Some comments and suggestions of those administrators who answered affirmatively to this question will be presented first, to be followed by some made by those who responded negatively.

Affirmative

Although roughly half the administrators indicated that PPBS would be a useful tool in management, many indicated a number of stipulations or qualifications. Probably the qualification mentioned most often was that it should be a modified, rather than a pure, system. One business officer indicated that PPBS is ". . . sometimes . . . too complex for understanding by faculty and staff. If simplified, a more useful tool . . ."

Several administrators indicated that it is essential for a commitment to PPBS to exist at all levels of the university. An academic dean stated that the proper implementation of PPBS requires ". . . sufficient additional resources to . . . perform in-depth analyses to support the system . . ." Another academic administrator suggested that it should be implemented slowly over a number of years. He commented that:

> Too many costs are fixed and resources not easily shifted given tenure policy and "steady" growth. Implementing PPBS must therefore be done over a period of years to reflect small but possible movements in resources.

One business officer, who felt it would be a useful tool, commented on the problem of output measures:

> The problem with PPBS is in the definition of output. In order for PPBS to be meaningful in a college environment, someone needs to come up with an output definition that would consider the unique role of higher education.

Another financial administrator's response indicated why he thought it generally had failed and made a suggestion as follows:

> Attempts probably have failed because the decision-making process in higher education is not hierarchical but is dispersed among a variety of centers which may or may not bear apparent relationships to one another. Hence the rather highly structured, integrated requirements of PPBS cannot readily be met. However, it is possible to incorporate the concepts of PPBS while avoiding the jargon and rigidly elaborate procedures.

An academic administrator commented that:

> . . . It is not useful or productive if it is used as a means of imposing constraints and judgments externally. If PPBS is to be effective in colleges and universities, a new level of trust and mutual respect must be attained.

Another financial administrator made the following interesting suggestions for its proper implementation:

> PPBS must be implemented carefully, slowly, and quietly. Carefully, because assurances of fiscal control must be maintained. Slowly, because the many people involved in decision-making and data-recording processes must have time to adapt to new concepts and ways of doing business. Quietly, so that pronouncements of achievements do not raise expectations beyond the range of feasibility.

Negative

A number of reasons were given as to why PPBS would not be a useful management tool. Most frequently mentioned, in no particular order, were the feeling that there is a lack of understanding of the concept, it is too difficult to implement, the program structure is not relevant to higher education, and measurable outcomes are lacking.

One academic administrator, who thought that PPBS was not much of an improvement over present budgeting practices, commented, "PPBS has generally failed due largely to a lack of user understanding of the process, and when understood, due to inaccurate input data. . . ."

Many business officers indicated that they felt PPBS is not a useful tool because it focuses on programs. One stated:

> . . . The definition of a program is too difficult to get agreement on. A program can be defined so broadly that it has no real control or so narrowly that it is useless.

This idea was echoed in the following response of another financial administrator:

> . . . The reality of the way in which universities operate is organizationally, not by programs which tend to cross organizational lines. Further, some segments of the university do not divide into logical programs suitable for PPBS approach.

The following comment illustrates why one business officer felt that pure PPBS might never be applicable in higher education.

> PPBS requires that outputs be quantifiable and measurable. The outputs of universities do not fit that description, will not fit it in the foreseeable future, may never fit it. . . ."

An academic dean simply stated that, "We should probably learn something from the fact that previous attempts have failed." And the following rather humorous comment was made by another academic administrator:

> Quite frankly, I have never understood PPBS. It is not clear whether my lack of understanding of, and appreciation for, PPBS stems from ignorance on my part or simply an uncanny ability to separate the important from the trivial.

Planners

The first question directed to planners was extensive. Its first part questioned whether the various states had attempted to implement PPBS at public colleges, and the second part investigated whether implementation was successful and whether it was deemed to be cost-effective. The question is reproduced below in its entirety:

> *(a) Has your state attempted to have public colleges or universities develop some form of Planning, Programming, Budgeting System (PPBS)?*
>
> *Yes*____ *No*____
>
> *If your answer is* yes, *explain the reasons for making such an attempt, and answer part (b). If* no, *were there any particular reasons why it has not been attempted?*
>
> *(b) Has such a system become operational?*
>
> *Yes*____ *No*____
>
> *If* yes, *explain whether you feel that the costs of implementation are worth the benefits being derived from such a system. If* no, *indicate the main reasons why you believe it has not become operational.*

Twenty-one of the 31 respondents indicated that their states had adopted some form of PPBS, and 13 of these indicated that the system had become operational. Responses to whether or not implementation was attempted will precede those as to whether it became operational.

Implementation Attempted?

The responses to the first part of the question indicated that a good deal of controversy and confusion exists about what actually constitutes PPBS. One respondent who replied negatively indicated that his state utilizes formula budgeting instead, while a planner who responded positively stated that, "The higher education system in (name of state) is formula based. To that extent a modified PPBS is operational. . . ." Another respondent who checked no then proceeded to describe a modified form of PPBS that was actually in use.

Thus, it became apparent that the responses to this question depended upon how the planners themselves defined PPBS. Although it would be misleading to take the responses to this question as representing the rate of attempted implementation, it is obvious that implementation is fairly widespread.

Very few of the respondents who answered the question negatively gave reasons why PPBS was not attempted. One did comment that, ". . . PPBS was not considered to be adequately tested and demonstrated to be successful enough for statewide implementation." Another respondent indicated that although his state does not require such a system, institutions are "pointed" toward PPBS through planning, reporting and budgeting efforts.

Diverse reasons were given for making an attempt to implement PPBS. Some of the more frequent reasons, in no particular order, were to satisfy the need for increased accountability, to promote comparable information, to assess needs of different universities, to assist in equitable distributions of resources, to assist in management decisions, to prevent duplication of programs, and to provide input for evaluation purposes. One reply indicated the following five reasons for making an attempt at implementation:

- To relate the goals and objectives of institutions to the budgeting process.
- To emphasize educational goals.
- To modernize current budgeting methods.
- To bridge the gap between institutional operations and the budgeting process.
- To emphasize student output.

Another planner stated that individual institutions, rather than the

state, adopted the system because of its perceived benefits. He responded:

> State colleges, on their own initiative, have developed a program budget system, in the belief that better management of very scarce resources is better able to be accomplished when expenditures and purposes are related. . . .

Operational?

The second part of the question asked whether attempted implementation was successful and whether it was worth the cost. Of the 21 respondents who indicated that their state had attempted implementation, 20 answered this part of the question. Of those, 13 indicated that it had become operational, five that it had not, and two created their own category — partially successful.

As with the response to the first part, it would be very misleading to accept these figures as representing the rate of implementation success or failure. For one thing, it was apparent that many of the positive and negative replies represented partially successful implementations. Some of the responses as to whether it was worth the effort or why it had failed, however, were very enlightening.

A number of reasons were given as to why implementation had failed. These included problems with outcome measurement, its political unacceptability, difficulty in obtaining comparable data, the time required, institutional resistance, and lack of economic and financial pressure. One respondent indicated the following reason why he felt it had failed:

> Unwieldly. Difficult to explain or understand. Too much paperwork. Inability to demonstrate that better results would be achieved.

Among the respondents who stated that the system had become operational, two indicated that it was difficult to evaluate whether the system is cost-effective. The comment was made that it is either too soon to know what the costs are or extremely difficult to estimate the benefits.

Among those who expressed an opinion about its cost-effectiveness there was a wide difference of opinion as to whether it was worthwhile. One planner stated emphatically that it is ". . . definitely worthwhile. . . ." Others who believed it was cost-effective were more guarded. One indicated that costs ". . . are potentially much less than the benefits." Another commented, "Costs are worth the benefits in the long run

because of improved identification of cost/expenditure centers." Still another stated that PPBS is "newly implemented — benefits are yet to be realized — we are optimistic."

There also were some strong negative feelings as to whether costs were worth the benefits. One planner indicated that although the system was implemented recently, ". . . benefits do not appear to be worth the effort." Another stated that, ". . . the real benefit of the systems in terms of improved resource allocation decisions based on cost-benefit analysis has yet to be realized." One planner recognized the fact that "the efforts . . . have not received sufficient attention or financial support. . . ." Another respondent echoed this feeling when he stated:

> . . . we have not made as much use of the planning data as we could have. In addition, we have not developed all of the computer software necessary to use all of the data collected. In summary we could be doing more extensive program analysis.

Another planner commented that:

> No good measurements of quality have been developed, and without that, the pure quantifiable measurements can lead to mediocrity rather than excellence.

Improvements In Budgeting

The interview results indicated that there was a strong feeling on the part of many that the budget process in colleges and universities should be improved. A question as to how this might be accomplished was asked of administrators only:

> *How do you think the budgeting process might be improved to assist in the more effective management of institutions of higher education?*

The response was a large number of diverse suggestions. Probably the comment made most often was that some system of rewarding good performance should be included in the budget process. Another suggestion was that the process of establishing goals should be improved. One academic administrator stated that:

> The main improvement to be made has to do with establishing goals. Once realistic goals are established, budgeting could be done so that they are reached.

Another frequently made suggestion dealt with improvements in costing in higher education. A business officer commented:

> It appears to me that the only way the budget process could be improved is to structure the budget in such a way as to make the task of determining the cost of instructional programs easier.

This idea was elaborated on in the following reply of another business officer:

> Budgetary and accounting data are oriented more for insuring fiscal control than for providing information useful for decision making. Budgets and financial reports provide only a partial record of the costs of organizational units and programs. For example, space rental, equipment depreciation, and utility costs are not attributed to academic departments. A more complete recording of total costs of each organizational unit and program not only would provide a basis for improved decision making, but also make individual managers of those units aware of the institutional cost implications of their actions.

A financial administrator made the following suggestions:

> The use of more cost/benefit analysis . . . will become more necessary in the future in order to improve effective management and utilization of resources in the budgeting process. All programs and priorities will need to be analyzed more often and more effectively in the future. A more intensive and continuous study of possible duplications of programs and areas will have to be undertaken in the budgeting process.

Many respondents indicated that the importance of quantitative data should not be overemphasized. A business officer asked for "less dependence on numbers of students, space, etc., and more sensitive attention to unique institutional needs." This was echoed in the following response of an academic administrator:

> The budgeting process could be substantially improved if those removed from the immediate understanding of program objectives and priorities would temper their enthusiasm for trying to make judgments with quantitative data in isolation from the value judgments and program qualities which must be primary.

A business officer indicated some requirements for good budgeting as follows:

> The budgeting process is one of estimating expenditure requirements and revenue projection. For the process to work, good historical cost

information must be available. This information must be available at various levels of aggregation and organized on a basis identical to the budgeted accounts. In order to manage the day-to-day operations of the institution, the budget process must be capable of manipulating large numbers of budget accounts rapidly in order to keep the budget up-to-date. The accounting system must then provide accurate, up-to-date expenditures and revenue information so that progress against budgets can be measured.

Along the same lines, another financial administrator's reply indicated some prerequisites and made some specific recommendations:

> First it is necessary to understand the role and scope of the institution. Second, short-range and long-range goals must be established. Guidelines should be developed in the budgeting process aimed at achieving the goals. Courses with very low census should be combined or cancelled. Replacement of terminated, retired, etc., personnel should result in review to determine continuing need for such employees. In order to provide equity of work and payment for individuals in like jobs, a classified personnel system should be followed in the preparation of the budget.

It also was suggested that increased participation in the budget procedure was needed at all levels, as well as the development of a better understanding of the relationship between budgeted amounts and outputs.

Output Measures

In order to solicit suggestions as to how the performance of an institution of higher education might be assessed, all three groups were asked the same question. It dealt with the identification of quantifiable output, or outcome measures of the educational process, and read as follows:

> *What types of quantifiable output measures would you suggest be used by institutions of higher education to measure how successfully they are fulfilling their goals?*

The responses indicated much disagreement as to the types of measures that might be used and whether any do exist. Although a good portion of the suggested measures were not quantifiable, and many were input rather than output measures, they will be included in the discussion. The responses of the administrators will be presented first, followed by those of the planners.

Administrators

One of the most frequently mentioned outputs was that of student credit hours (SCH). Some administrators indicated an input measure — the cost per SCH — and others an output measure — number of SCH's produced. One respondent suggested the unit measure cost/SCH, ". . . provided such costs are computed using nationally accepted definitions and methods of allocation."

Another frequently mentioned output measure related to degrees. Some people indicated that the measure should be the cost per degree and others the number of degrees granted. One administrator who suggested the number of degrees as an output measure conceded that it is not a complete measure; however, ". . . higher education has a mission to provide progress toward a degree, so completed degrees must be an output."

A number of respondents suggested that output should be related to student achievements. Some of the proposed measures included starting salaries of graduates, student career successes, acceptances to graduate school, and student placement in jobs related to their major. Other student-related outputs included student test achievement and graduates' satisfaction with programs. One financial administrator suggested, ". . . Follow-up interviews, at five- or ten-year intervals, with graduates for their opinion on quality and benefits received by them from the education received at the institution."

Other suggested outputs were related to faculty members. These measures dealt with faculty scholarly productivity (publication, awards, and such), faculty time utilized and work load. One respondent suggested the use of the student/faculty ratio. Another faculty-related measure dealt with the quality of research performed at an institution. Suggestions of how research quality could be assessed included judgment as to the extent and level of research and the number of grants and contracts received by an institution.

Some administrators' recommendations dealt with how outsiders perceived the institution. Respondents said that this would be reflected by ". . . the ability to draw students to the campus because of the quality of the program," or ". . . the number of graduates that obtain positions upon graduation because recruiters regard the education received by the individual to be of high quality." Another referred to outsiders' opinions of the "reputation" of the institution. Some administrators suggested that the amount of support received from outside sources might be used to assess "reputation."

One business officer commented that the measures now being used

(SCH's, degrees granted, and such) ". . . are not considered adequate . . . but are the only ones available at this time." Another financial administrator said:

> Strictly speaking, there aren't any quantifiable output measures for higher education. SCH is as good a surrogate as any on the instructional side. On the research side, we have only input surrogates like dollars expended or hours worked. In both cases the quality problem seems nearly insoluble in the present state of the art.

The need to establish meaningful goals and objectives before output measures can be developed was expressed by several respondents. One academic administrator indicated that:

> Quantifiable output measures in higher education are most difficult in the absence of qualitative and human development variables which must be considered in the same context. It is folly to attempt to identify generalized outcome measures in the absence of a clear understanding of the program values and objectives.

A few indicated that these measures should be different for various institutions because of the differences in the goals and missions of institutions.

Several respondents discussed the great number of problems inherent in developing quantifiable output measures. An academic dean cautioned against placing too much reliance on an outcome simply because it is quantifiable:

> . . . (This is) very risky because the quantifiable measures tend to obscure the important subjective judgments of quality, intellectual excitement, etc. Cost/SCH, Cost/degree granted, faculty scholarly productivity, student career successes are all possibly useful if kept in context.

Another business officer indicated the problem caused by joint outputs (research and teaching):

> . . . There are no pat answers . . . The problem is compounded at major research institutions where the distinction between research and instruction makes the finite definition of instructional costs almost impossible. Further, it is not clear that quantifiable output measures are available in the field of research.

Several administrators declined to answer this question, indicating that it is a very difficult area and that they were not sure if any such

measures existed. Finally one business officer suggested one output he feels should *not* be used and why.

> Output measures are always most difficult where a service rather than a product is the end result. I have no sympathy for the notion of computing the dollar earning power of degrees or degree holders as a good measure. The function of a university is to provide a learning atmosphere, not generate economic units of earning power . . .

Planners

Although the suggestions of the planners also were diverse, a good portion of the responses centered around the use of input cost as a measure of outcomes. Probably the most popular ones were the unit measures cost per SCH and cost per degree. Others included the cost of programs and the cost of specific centers such as the library or computer center. One respondent suggested a comparison of actual costs with appropriation requests incurred by element.

In general, planners were much less interested in outcomes related to the performance of students or faculty than were administrators. They seemed to be more interested in student assessment of satisfaction. One planner commented:

> Quantifiable measures for higher education are difficult to determine. The best measure probably would be to survey all students who attended an institution to determine if they felt the education they received was valuable to them.

As could be expected, the planners suggested quite a few measures that were the same as those suggested by the administrators. In addition, several also suggested the NCHEMS tools. One interesting response included: library holdings — number of volumes; square feet of space maintained; headcount — students registered.

Very few planners' responses were related to the measurement of the amount of knowledge attained by the student. As a whole, the planners seemed to be very interested in the problems of the assessment of research and public service. One planner indicated that research and service should be measured against what each was supposed to accomplish. Another suggested as a measure, ". . . external research dollars per dollar of research expenditures. . . ," while another suggested two sets of diverse outputs, one for instruction and one for research. The latter's complete reply is:

> The number of headcount students, FTE's contact hours, degrees, certificates or awards, short courses, and special seminars all could be

used to quantifiably measure output in terms of the primary functions of instruction. The number of grants, special contracts, articles published, etc., could be used to measure output for the function of research.

As with administrators, a few planners commented that output measures could not be established until appropriate goals and objectives were established. One stated that output measures ". . . depend on goals, but student credit hours and continuing education units continue to be essential to our work. . . ."

A number of the respondents indicated the many problems involved in this area. Their comments basically were the same as those of the administrators. One planner, after listing two measures, indicated ". . .I refrain from adding too many since the issue of output measures in higher education is highly debatable and given to multiple interpretation."

Finally, a planner indicated that some of the concepts to be discussed in this report should be used in the management of institutions of higher education. He stated that:

> We believe that Program Budgeting, Zero-Base Budgeting, Management by Objectives have a place in the education community. Institution presidents and top management as well as faculty must support any effort in order that any accomplishment of these efforts is to be successful. A commitment must be made and resources must be made available in order that these techniques become successful. The state of the art has been developed sufficiently whereby systems are available for any institution or state-level agency to develop and implement these management techniques.

Chapter 3

Costing Concepts for Higher Education

The results of this study indicate that colleges and universities use the full-costing concept extensively. Some of the participants, however, seriously doubted the relevance of full costs for decision-making purposes.

In this chapter the author presents some problems found in trying to determine costs in higher education. These will be followed by a thorough discussion of the determination of full costs. Finally, the author examines the concepts of standard costs and variable costs and their applicability to colleges and universities.

Costs Defined

The term "cost" can be defined in many different ways. The National Center for Higher Education Management Systems (NCHEMS) defines costs in higher education:[1]

> Costs . . . are defined as the measure in dollars of institutional resources used in the process of providing institutional outputs during a given time period.

The National Association of College and University Business Officers (NACUBO) describes cost accounting and the costing process as follows:[2]

> Cost accounting is concerned with accumulating, classifying, summarizing, interpreting, and reporting the cost of personnel, goods and services, and other expenses incurred to determine unit costs. . . . The costing process is designed to assign or allocate costs to particular units of service provided.

Factors Making Cost Analysis Difficult

The study exposed a number of factors that present problems for persons attempting to determine and use cost data in higher education. Most of these factors relate to the problem of measurement and the resulting concerns and fears over the possible misuse of cost data in the decision-making process. Some of these will be discussed in the following paragraphs.

Problems of Measurement

Colleges and universities follow the principles of fund accounting, which emphasizes financial stewardship rather than the cost of resources utilized. In addition, these institutions organizationally are classified into academic departments. Because these departments are engaged in markedly different activities, they are not useful cost centers for costing purposes.

The services provided by higher education are classified into three activities — instruction, research and public service. These three interrelated activities form an institution's total educational program. Often a single activity (a common or joint cost) may involve two or more functions. For example, a faculty member usually performs all three of these activities, so the allocation of common costs to activity presents a serious problem. Another significant problem is measuring the results or outcomes of the educational process. This study examined in-depth the concept of outcomes, and the results are presented in Chapter 6.

Concerns and Fears

Universities are highly complex and vary significantly in mission, style, size and character of organization. In addition to cost, any measurement process must take into consideration such factors as the quality of education and the mission of the school. Because these factors cannot be assessed easily, educators fear that too much emphasis will be placed on the cost data that are relatively easy to determine. If both internal and external parties place too much emphasis on costs, harmful decisions could be made. The abandonment of high-cost but necessary programs very easily could result, which would lead to a decline in quality.

Respondents also expressed concern that costing data might be used to make erroneous comparisons with other institutions and as a basis for allocating resources among institutions. This situation would lead to a "cheaper-is-better" attitude and overall declining quality as well as

inducing institutional conformity. There also was apprehension that cost data would be the main criteria used to evaluate a university program, which not only might result in poor decisions, but also could lead to a loss in academic freedom.

Many participants agreed that a number of unique measurement problems exist in higher education. They stated, however, that if cost information were gathered and analyzed properly and used carefully as only *one* input to the decision-making process, it could contribute to better management. One participant said:

> Cost analysis is an extremely powerful tool and, if used improperly, would certainly lead to poor decisions. The fact that a powerful tool is potentially dangerous is no reason to ignore it. On the contrary, it should lead to a desire to develop that tool properly so that it will be used to its full potential.

Full Costing

All phases of this study confirmed that institutions of higher education utilize the full-costing concept extensively. Full costs are ". . . the accumulation of all *direct* and *indirect* costs attributed to units of service."[3] *Direct* costs are those costs that are easily identifiable with a cost objective (e.g., an academic program) and can be charged to that objective with a reasonable degree of accuracy. The most common direct costs of a department are the instructor's salary and costs of supplies used in the teaching of courses in a department. *Indirect* costs, also referred to as support costs, are those that are not readily identifiable with a cost objective. Indirect costs and their treatment have been described as:[4]

> . . . those costs of an institution which are not readily identifiable with a particular project or activity but nevertheless are necessary to the general operation of the institution and the conduct of its activities. . . . In theory, all such costs might be charged directly; practical difficulties, however, preclude such an approach. Therefore, they are usually grouped into common pool(s) and distributed to those institutional activities benefited through a cost allocation process.

Examples of indirect costs are:

- Library expense
- Costs of operating and maintaining buildings
- Research administration and expense

- Departmental and administrative salaries
- General administration expenses

In order to determine the full cost of an activity, it is necessary to allocate the indirect costs applicable to that activity. The selection of an allocation procedure to use will be discussed shortly.

Conversion to a Program Classification

As already indicated, an institution of higher education typically is classified by academic departments. Based on this study, it would appear that planning would be facilitated if this departmental classification were converted to a program classification. Such a program format ". . . identifies and categorizes the activities in higher education institutions at a level of detail that results in cost centers that contain relatively homogeneous activities."[5] NCHEMS and others have developed a Program Classification Structure (PCS) to facilitate this conversion process. PCS will be discussed further in the chapter dealing with PPBS.

An example of instructional costs reported on a program basis is included in Exhibit 3-1. Because each division within a program contains relatively homogeneous activities, direct instructional costs can be calculated quickly by multiplying student enrollments by average annual cost per student. It is interesting to note the substantial differences in unit costs between programs as well as between divisions within a program. Current average annual cost per student vary from a low of $779 for a lower division history student to a high of $3,155 for a graduate division biology student. The calculation of unit costs will be discussed in a later section.

Allocation of Indirect Costs

As in an industrial firm, the allocation of indirect costs to cost objectives in an educational institution is often troublesome. Ideally, these costs should be charged to cost objectives in a manner which is related to the amount of benefits received. Practically, indirect costs are accumulated into cost pools, which are then allocated on an equitable basis to the benefiting cost objectives. Such a basis is one that ". . . relates to the benefits received . . . the activities of the cost objective that logically and reasonably caused the cost to occur."[6]

Some typical measures used to allocate indirect or support costs are shown on page 30.

EXHIBIT 3-1

Direct Instructional Costs

Instructional Programs	Student Enrollments		Average Annual Cost Per Student (Rounded to Nearest Dollar)		Total Direct Instructional Cost	
	Current	Projected	Current	Projected	Current	Projected
History						
Lower Division	143	157	$ 779	$ 772	$ 111,327	$ 121,409
Upper Division	186	195	1,127	1,115	209,656	217,843
Graduate Division	52	49	1,704	2,006	88,619	99,079
TOTAL	381	401			$ 409,602	$ 438,331
Biology						
Lower Division	121	133	$1,168	$1,155	$ 141,340	$ 153,688
Upper Division	94	98	1,958	2,046	184,041	201,899
Graduate Division	45	42	3,155	3,569	141,974	152,595
TOTAL	260	273			$ 467,355	$ 508,182
Fine Arts						
Lower Division	85	93	$ 987	$ 953	$ 83,918	$ 89,066
Upper Division	61	64	1,451	1,418	88,487	90,821
Graduate Division	17	16	2,532	2,375	43,048	38,361
TOTAL	163	173			$ 215,453	$ 218,248
Business						
Lower Division	180	198	$ 853	$ 850	$ 153,619	$ 168,211
Upper Division	206	216	1,466	1,572	301,973	339,922
Graduate Division	124	117	1,851	2,242	229,510	264,084
TOTAL	510	531			$ 685,102	$ 772,217
TOTAL	1,314	1,378			$1,777,512	$1,936,978

(From D.G. Clark and R.A. Huff, *Instructional Program Budgeting in Higher Education*, p. 22.)

Activity Center	Method of Allocation
Library	FTE Faculty, FTE Students
Other Academic Support	Direct Costs
Student Services	Instructional Unit
Physical Plant Operations	Direct Costs
General Administration	Direct Costs
Student Aid	Instructional Unit

Some alternate allocation criteria sometimes used include:

- Faculty Compensation
- Faculty Headcount
- Faculty Contact Hour
- Student Credit Hour
- Course Enrollment
- Assignable Square Feet
- Supplies and Service Expenditures

Once the allocation method has been determined, it should then be possible to allocate all costs of support programs to cost objectives. Three popular allocation techniques are direct, recursive or step-down, and cross-allocation or simultaneous.

The direct allocation method probably is the most widely used since it is simplest. It assumes that all indirect costs contribute directly and exclusively to primary (academic) programs. Thus, they are directly assigned only to primary programs.

The step-down method recognizes that certain indirect costs benefit other than only academic programs. It therefore allocates these costs to support programs as an intermediate step, following a high-low or priority ranking.

The cross-allocation method is the most complex. It involves allocations between related programs and requires the use of simultaneous equations.[7]

Unit Costs

The study confirms that the calculation of costs per unit is very prevalent. The determination of unit costs requires that costs be related to a measure of output. It was found that calculation of unit costs varies significantly. The numerator was either full costs or only instructional costs. The use of a denominator, or measure of output, varied to a greater degree. Probably the most frequently used denominators were Full-Time Equivalents (FTE) and Student Credit Hours (SCH).

This project revealed that there is a serious disagreement and lack of consistency as to how each of these two terms is defined. In NCHEMS' *Cost Finding Principles and Procedures* manual, the terms are defined as follows:

> *Full-Time Equivalent* — The equivalent of one person who is deemed to be carrying a full load or having a full-time appointment in terms of institutionally agreed upon conventions . . .[8]
>
> *Student Credit Hour* — A unit of measure which represents one student engaged in an activity for which one hour of credit toward a degree or other certificate will be granted upon successful completion.[9]

Very often institutions define FTE in terms of SCH. The lack of consistency in determining the denominator and numerator makes the comparison of unit costs among institutions very misleading.

In practice, an institution often calculates a number of unit cost measures at the same time. In the report shown in Exhibit 3-2, teacher salaries, other salaries and other costs are combined to obtain total costs. This amount then is divided by the appropriate measure to yield cost per student, student credit and student contact hour.

Exhibit 3-3 presents a report which should prove to be useful in planning and control at a college or university. The report contains calculations of SCH and the average percentage change in both SCH and average salary. It also presents SCH per FTE faculty, average percentage change in SCH per FTE, total expenses per SCH, and salaries per SCH. An investigation of the reasons for significant changes in some of these measures over the years could lead to the discovery of inefficiencies.

A number of organizations have developed models which can be used by colleges and universities to determine unit costs of various programs. NCHEMS, which has done quite a bit of work in this area, has developed such a model — the Resource Requirements Prediction Model (RRPM). This model will be discussed in some detail in the next chapter.

Many participants emphasized that even within the same institution the interpretation of unit costs must be conducted with extreme care. The fact that the unit cost of one department is lower than that of another may be due to one of the following, not necessarily favorable, conditions:

- The base (e.g., SCH) is very high because the department primarily offers required courses.
- The department may be weak and underfunded; thus its numerator (expenditures) is lower than a more adequately funded department.

EXHIBIT 3-2

Cost Analysis Report

ACTIVITY COST ANALYSIS

Department	College	Course Number	Instr. Type/	Session	No. Sects.	Enrol.	Student Credits	Teach. —— $	Sal. —— %	Other Salaries	Other Costs	Total Costs	Cost/ Student	Cost/ Student Credit	Cost/ Student Con. Hr.
9-PHIL	2-A&S	101	1	1	5	165	495	24698	85	3598	709	29005	176	58.60	3.91
		104	1	1	1	25	75	600	48	545	108	1253	50	16.71	1.11
		202	1	1	3	93	279	12197	83	2028	400	14625	157	52.42	3.49
		203	1	1	1	19	57	4020	89	414	82	4516	238	79.23	5.28
		206	1	1	1	14	42	4157	92	305	60	4522	323	107.67	7.18
		207	1	1	1	25	75	4020	86	545	108	4673	187	62.31	4.15
		215	1	1	1	7	21	8234	98	153	30	8417	1202	400.81	26.72
		291H	1	1	1	8	24	4075	95	174	35	4284	536	178.50	17.85
		340	1	1	1	16	48	4075	91	349	69	4493	281	93.60	6.24
TOTAL FOR DEPARTMENT					15	372	1116	66076	87	8111	1601	75788	204	67.91	4.56

(From Systems Dimensions Limited, *Campus PMS: An Overview*, p. 68.)

EXHIBIT 3-3

Cost Report

ENGLISH DEPARTMENT

LINE NO.	PLANNING ITEM	1966	1967	1968	1969	1970	1971
1	Ave Credits/Section	3.00	3.00	3.00	3.00	3.00	3.00
2	Registrations	1026.00	997.00	1066.00	958.00	756.00	753.00
3	Student Credit Hours-SCH	3078.00	2991.00	3198.00	2874.00	2268.00	2259.00
7	Ave Pct Chg In SCH	8.57	2.87	4.22	0.63	—3.71	—3.16
29							
8	FTE Faculty	5.00	5.00	5.00	5.00	4.00	4.00
10	Average Salary	10750.00	11450.00	12460.00	13314.00	14325.00	15000.00
14	Ave Pct Chg In Ave Sal	5.39	5.95	6.91	6.89	7.03	6.65
29							
9	Total Salaries	53750.00	57250.00	62300.00	66570.00	57300.00	60000 00
15	Support Budget	800.00	950.00	1030.00	1000.00	900.00	900.00
16	Total Expense	54550.00	58200.00	63330.00	67570.00	58200.00	60900.00
29							
22	SCH Per FTE Faculty	615.60	598.20	639.60	574.80	567.00	564.75
26	Ave Pct Chg In SCH/FTE	8.57	2.87	4.22	0.63	0.24	0.13
27	Total Expenses Per SCH	17.72	19.46	19.80	23.51	25.66	26.96
28	Salaries Per SCH	17.46	19.14	19.48	23.16	25.26	26.56

(From Midwest Research Institute, *Techniques for Institutional Research and Long Range Planning for Colleges and Universities*, Volume II, p. 73.)

- The instruction offered by this department is by its nature less expensive than that offered by other departments.

As previously indicated, some participants seriously doubted the usefulness of full-cost data in the decision-making process. They contended that the management of a university often is confronted with having to make future predictions of costs based on changing conditions. To do this it must assess marginal costs based on knowing the fixed and variable factors in the composition of those costs. The concept of variable costing, to be discussed later in this chapter, should assist in making such decisions.

Standard Costing

Standard costing is a well-established and valuable device in the management of manufacturing and, to a lesser degree, of service businesses. Standards can be set at various levels from ideal, which assumes maximum efficiency, to attainable. If set at attainable levels, they would represent what costs *should* be under expected efficient conditions.

This study indicates that higher education has made very little use of standard costs, and almost no literature exists on the subject of how they might be used at colleges and universities. This section illustrates some of the uses of standard costs and will be followed by a brief illustration of how one of the universities interviewed attempted to make limited use of standard costs in its operations.

Uses of Standard Costs

Standards usually combine previous experience and future expectations to establish predicted levels of performance for a particular activity. A great deal of time and effort is spent in developing standards and keeping them current. Thus, they are an important tool in monitoring operations and assessing performance.

Reports in which actual costs are compared to standards are prepared periodically. The difference between these figures represents variances from standard, which can be analyzed. By proper analysis, the reasons for the variances as well as persons who might be held responsible for them can be determined. Consequently, corrective action can be taken.

As indicated, standard costs are an excellent benchmark of performance. A common technique used to assess performance is to compare

actual costs incurred to budgeted costs. Study results indicate that in higher education, budgeted costs often are not based on what costs *should* be but rather are determined by such factors as the amount of resources available and amounts expended in prior years. Thus the budget usually is less than or more than the amount required. Since standard costs do represent what costs should be, they would seem to be a much better indicator to gauge performance in higher education.

Standards also should be helpful to educators in preparing realistic budgets or when making a variety of decisions in a university.

Standard Costing at a University

This brief illustration is taken from the experience of one of the participants in the interview phase of this study. At this institution, current cost standards are developed within academic departments at the course level and only for those costs that are clearly attributable to instruction. Thus, standard costs are developed for faculty salaries, which are considered direct costs, and other indirect costs, such as staff support salaries, travel, supplies, equipment, and departmental research, of a department. These standards represent what the expenses could be expected to be during the coming year.

Standards initially are set up by using historical records and future projections. Faculty salaries, which represent the major portion of all costs, are distributed to courses within a program on the basis of Teacher Contact Hours (TCH). The indirect costs of a department are accumulated in a pool. This pool is distributed to individual courses based on the proportion of TCH's used in teaching a specific course to the total TCH's in the department. This total cost is then divided by the Student Credit Hours (SCH) within a course to arrive at the standard cost per SCH.

These standards represent what one can expect costs to be in the coming year. Comparisons then are made between actual and standard costs. The resulting differences or variances are analyzed and reasons for them determined. Corrective action, if necessary, then can be taken.

The university indicated that variances that arose sometimes were due to factors that did not indicate poor performance or that were not controllable by the department. These factors included changes in assumed faculty-student ratio, faculty-rank mix, salary schedule, or assignments. The analysis of the reasons for other "controllable" variances, however, led to the discovery and correction of inefficiencies.

An important advantage to the development of these standards was

that they helped administrators to learn more about the operations of their institution. For instance, although it generally was known that certain courses were more expensive than others, in the process of developing standards, the educators better understood the reasons for these differences. They concluded that the development of standards resulted in better management of the university.

Variable Costing

Like standard costing, variable costing is a valuable tool in the decision-making process of industrial firms. The concept of cost variability at colleges and universities has received little attention in practice, however, and until recently, in the literature. A number of participants, however, expressed a belief that the careful identification of costs as either fixed or variable could result in better planning at institutions of higher learning.

NACUBO's Costing Standards Committee has sponsored studies which examined the potential applicability of a number of costing concepts to colleges and universities. In October 1975, NACUBO published, as part of *Administrative Service*, the report "Fundamental Considerations for Determining Cost Information in Higher Education."[10] The report recommends that various costs (i.e., standard and variable), rather than only full costs, should be calculated for use in decision making. The selection of an appropriate costing approach should depend on the purpose of the resulting cost data. To ensure that the results of alternative approaches would be valid, higher education should develop industry-wide costing standards, according to the report. The report proposes the following 12 standards:

1. The purposes for which cost information is to be used should determine the framework within which cost information is developed.
2. Cost information should be based on the accrual method of accounting.
3. Cost data should be reconcilable to official financial accounting data.
4. Nonfinancial data should be reconcilable to official institutional records.
5. Definitions used in cost determinations should be applied uniformly.
6. Cost information and related costing units should cover the same period.

7. Cost information should be consistently determined.
8. Cost should be attributed to a cost objective based on a causal or beneficial relationship.
9. Indirect costs should be allocated based on quantitative measures that can be applied in a practical manner.
10. Common costs incurred to provide two or more services should be allocated in an equitable manner.
11. Capital cost of a cost objective should reflect the applicable expired capital cost of the period.
12. Cost information should be accompanied by a disclosure statement.

A discussion of each of these standards is contained in Appendix A.

In May 1977, as part of NACUBO's *Professional File*, the report "Cost Behavior Analysis for Planning in Higher Education"[11] was published. This report contains an extensive discussion of variable costing. The following pages are based on that publication and apply some concepts of cost variability from industrial firms to colleges and universities.

Variable Costs

Under the variable costing concept, all costs and income are identified as either variable or fixed. An expense or revenue item is classified as variable if it increases or decreases in direct proportion to the changes in the amount of services provided over a given period of time. While full costing accumulates *all* costs, variable costing considers only those direct and indirect items that fluctuate in direct proportion to an activity base.

A typical example of a variable cost in a university would be the cost of paper used for student records, while an item of variable income would be revenue received for students based on each credit hour of instruction provided. It is clear that both these items would vary in direct proportion to the number of students or the number of student credit hours of instruction.

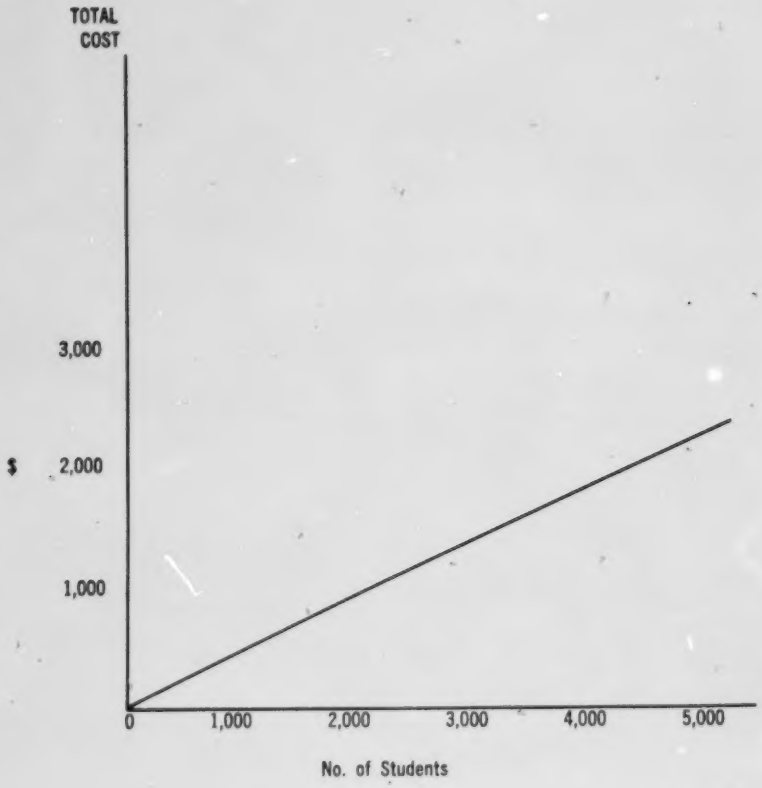
The graph in Exhibit 3-4 illustrates how the cost of paper will vary with changes in an activity base (number of students in this case). As the number of students increases, this cost will increase proportionately, and vice versa. At each level of volume, the ratio of total cost to the number of students remains the same — an assumed 50 cents.

Fixed Costs

If cost or revenue remains constant in spite of a change in the activity

EXHIBIT 3-4

Variable Cost—Cost of Paper



base within a given range, it is considered fixed. A typical fixed cost of a university would be the cost of a dean's salary, while fixed revenue might be unrestricted gifts and grants. It should be noted that fixed costs don't necessarily have to remain constant. For example, the amount of the dean's salary could change, but it still would be a fixed cost because it does not change in direct proportion to the level of activity.

Mixed Costs

Mixed costs and revenue items, sometimes referred to as semivariable, contain both fixed and variable components. The fixed portion of these items is required to maintain a minimum level of service or is constant due to a contractual obligation (e.g., tenure). Once a threshold level has been attained, additional costs which vary with volume will be incurred — resulting in a step-like pattern.

A good example of a mixed cost is the cost of faculty. In order to maintain an academic department, it usually is necessary to maintain a certain base of faculty members regardless of student demand. These members generally are tenured and represent a fixed cost. If demand should rise above a certain level, the university might decide to hire nontenured faculty (a variable cost) to teach additional sections. This variable component of the mixed cost would increase the total expense for each additional faculty member hired. This relationship is illustrated in the graph in Exhibit 3-5.

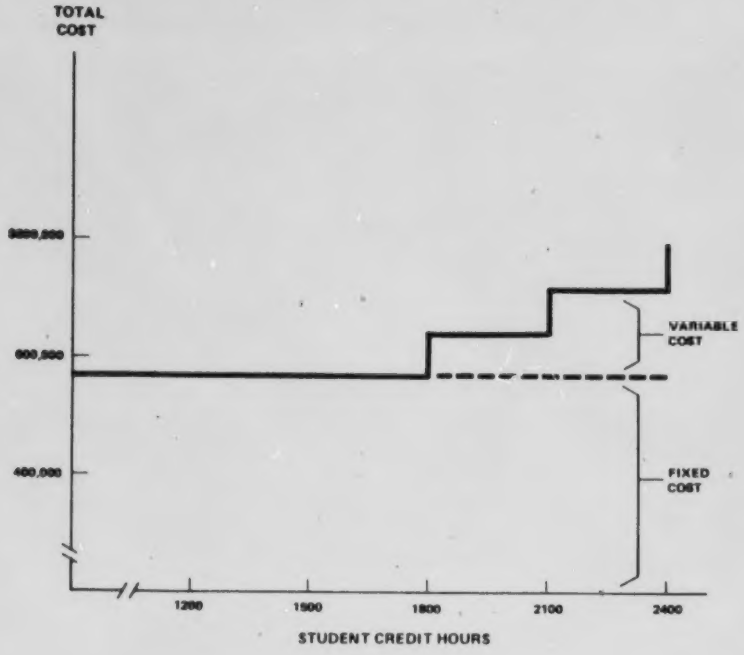
The graph shows how faculty costs behave with changes in student credit hours. It indicates that the fixed portion of faculty costs is $550,000. This cost does not change up to a level of 1,800 student credit hours (SCH). Above this level, it is necessary to hire one additional nontenured faculty member to teach 300 additional SCH's. This variable component will increase total cost for each additional 300 student credit hours, thus increasing in steps.

Determining an Activity Base

As indicated previously, the cost of paper used for student records at a university varied with the number of students enrolled. Although this is obvious, the selection of an activity base with which to relate cost behavior in higher education is not always clear-cut. In industrial firms, variable costs vary with the volume of output. The greater the output of the final product, the greater will be the expenses for direct materials, direct labor and variable overhead.

EXHIBIT 3-5

Mixed Cost—Cost of Faculty



Reprinted from Daniel D. Robinson et al., "Cost Behavior Analysis For Planning in Higher Education," *Professional File*, May 1977, p. 9, by permission of the National Association of College and University Business Officers.

Unfortunately, the same concept cannot be applied to higher education. First of all, the "products" of these institutions cannot be quantified readily. In addition, there may be no correlation between the input and output of the education process. In industry, the greater the amount of materials and labor that go into the process, generally the greater the output. In education, greater input costs may not affect the output at all.

Since output in higher education is not readily quantifiable and costs do not necessarily vary with output, another measure of activity must be found. The NACUBO studies referred to earlier suggest that, in higher education, costs should be related to an educational *process* rather than educational products. These studies also suggest that costs probably vary with *different* activity bases. For example, teaching costs will tend to vary with some measure of enrollment and student services with headcount. Thus, a good deal of additional research is needed before one can identify those activity bases that should be related to the behavior of different costs.

Conclusion

Research indicates that full costs are used extensively in higher education. This study also disclosed that the concepts of standard and variable costs might have applicability in this environment. Before these concepts can be used, however, additional research on the behavior of costs at colleges and universities is necessary.

NOTES

1. Gordon Ziemer, et al., *Cost Finding Principles and Procedures,* Technical Report 26, NCHEMS, Boulder, Colo., 1971, p. 10.
2. National Association of College and University Business Officers, "Fundamental Considerations for Determining Cost Information in Higher Education," in *College and University Business Administration—Administrative Service,* Section 4:5, Author, Washington, D. C., 1974, p. 3.
3. *Ibid.,* p. 8.
4. U. S. Department of Health, Education and Welfare, *A Guide for Colleges and Universities: Cost Principles and Procedures for Establishing Indirect Cost and Other Rates . . .,* Author, 1974, p. 1.
5. Gordon Ziemer, T.R. 26, *op. cit.,* p. 24.
6. NACUBO, "Fundamental Considerations . . .", *op. cit.,* p. 10.

7. For a further discussion of these techniques, see Gordon Ziemer, T.R. 26, *op. cit.*, pp. 67-87.

8. Gordon Ziemer, T.R. 26, *op. cit.*, p. 289.

9. *Ibid.*, p. 292.

10. NACUBO, "Fundamental Considerations . . ." *op cit.*

11. Daniel D. Robinson, et al., "Cost Behavior Analysis For Planning in Higher Education," *NACUBO Professional File*, May 1977.

Chapter 4

Planning and Budgeting in Higher Education

Proper planning and budgeting are essential to the continued success of any organization. The results of this study indicate that there is an increasing desire on the part of the higher educational community to improve these processes in colleges and universities.

In this chapter the author discusses the general concepts of planning and budgeting as well as the applicability of MIS and simulation models to institutions of higher education. The next chapter covers the concepts of PPBS and Zero-Base Budgeting.

The Planning Process

Planning is that part of the management process which attempts to determine the best course of action. The chief purpose of planning at a university has been stated as follows:[1]

> . . . to assure that goals and objectives are identified consistent with institutional mission and that programs are developed to achieve institutional goals and objectives . . . (and) to assure that systematic and rational consideration has been given, and will be given, to the use of resources.

Integral parts of planning, therefore, include the development of goals and objectives as well as a consideration of alternatives. The National Association of College and University Business Officers (NACUBO) indicates that the planning process accomplishes four objectives:[2]

1. Determines what is to be done (institutional goals and academic program decisions),
2. Develops operational plans to do it (support programs and budgets),

3. Adopts controls to test if the plans are being followed (operating statements, program reviews), and
4. Establishes a system of evaluation to determine plan achievements (analyzes and measures results).

The Budget Process

The preparation of the budget is an essential part of the planning process. The principal purpose of a budget has been stated to be: ". . . the translation of . . . educational priorities and decisions into reality . . ."[3] G. B. Robins, in the monograph *Understanding the College Budget*,[4] describes a simple process of budget preparation. He suggests that the budget process should consist of three phases, which are shown in the flowchart in Exhibit 4-1. This process must by cyclical and continuous and always subject to revision.

The process starts with a rather broad long-range plan. This plan provides input to be used for the development of a more predictable medium-range plan. Finally, the budget for operating the institution for the coming year is prepared. A discussion of these phases is contained on the following pages.

Long-Range Planning

The first phase deals with developing a long-range plan which will be used as the basis for all subsequent planning decisions. This phase should cover a long-term period, e.g., 10 years. Some of the major steps of this phase are discussed below.

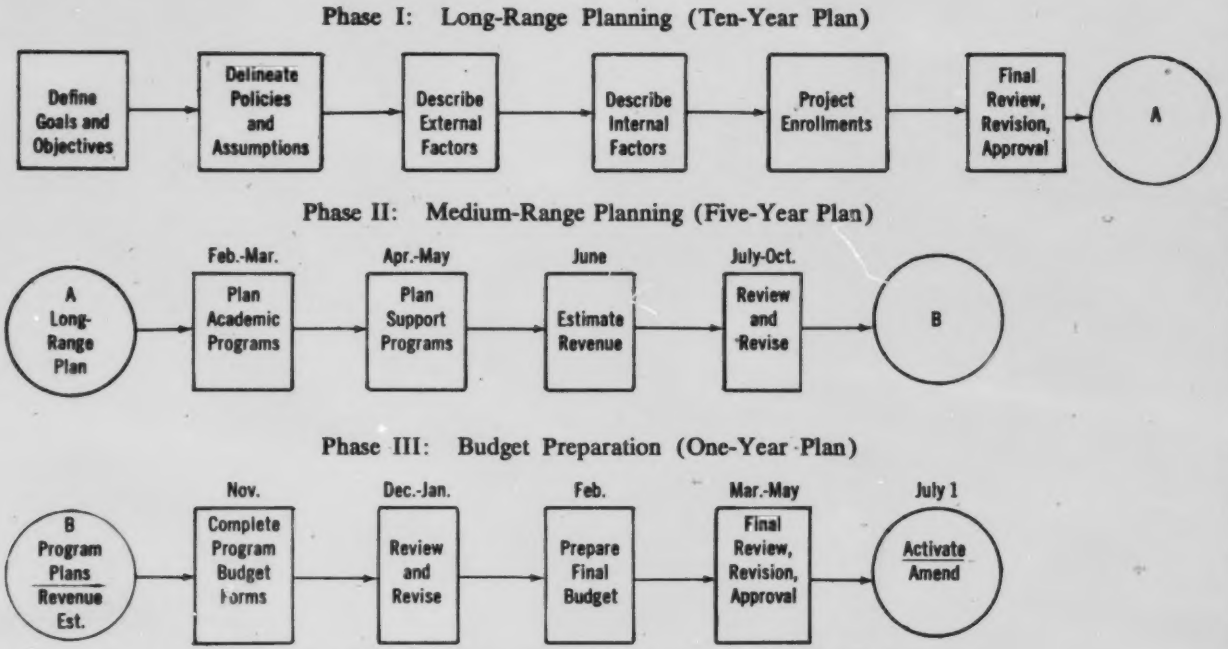
Goals and Objectives

The formulation of goals and objectives should be the first step in any planning process. Only after the goals of an institution have been understood can the best allocation of resources which will help to accomplish them be determined.

To be most effective, goals should be measurable. The establishment of goals that can be measured readily presents a problem in higher education. A common solution is to state goals in the context of outputs (e.g., number of degrees granted, student credit hours taught, and such). The establishment of goals and objectives is discussed further in the next chapter in the section on PPBS. The subject of output or outcome measures is discussed in Chapter 6.

EXHIBIT 4-1

Budgeting Flowchart



(Adapted from G. B. Robins, *Understanding the College Budget*, p. 19.)

45

External Factors

A number of external factors will have a serious effect on the operations of colleges and universities and therefore must be recognized in the long-range plan. These factors may be due to political, economic or social conditions.

Economic indicators should be assessed to assist in estimating the future well-being of the nation. An understanding of this well-being will help to determine the future enrollment of students as well as the amount of funds that will be available from federal, state, and private sources.

The public's attitude toward higher education also should be appraised. This attitude could affect federal legislation on the funding of public and private institutions and future enrollment. Among other obvious factors that should be considered are changes in draft laws, the beginning of a war, and shortages in a particular field.

Internal Factors

For proper budget decision making, a good understanding of the internal conditions of a university is imperative. Some of the more important internal factors deal with faculty and curriculum matters such as the policy on loads, salaries, tenure, research, class size, teaching styles, and programs offered.

An important internal factor that must be considered is the policy-making process and power structure of the university. In addition, the composition and needs of the student body, the requirements of the support functions, and the financial situation of the institution must be considered.

Enrollment Projections

Perhaps the most important element of a university budget is the projection of enrollment. The level of enrollment influences the operation of almost all areas of a university and thus is analogous to sales forecasting in an industrial firm. Enrollment is the major determinant of both resource requirements and resource availability, so it is essential that its projection receive special attention.

The interviewees indicated that historical data are relied on heavily in making the enrollment projection. This projection often is based on previous enrollment figures adjusted for assumed growth.

In addition, a number of the respondents in the study indicated that

enrollment projections are being complicated by growing student mobility. Today's students tend to shift program and degree objectives at an increasing rate, and universities frequently are utilizing more sophisticated simulation models to assist in this projection process. The Resource Requirements Prediction Model (RRPM) was one such model that is being used by a number of participants in this study. (It will be discussed later in this chapter.)

Medium-Range Planning

The medium-range plan, usually five years in length, is more predictable than the 10-year plan and more representative than the one-year plan. Assuming that the fiscal year starts July 1, this phase should be started in February and completed during October of the previous calendar year. The suggested timing of each of the steps in this phase is included in the flowchart.

Academic and Support Planning

The development of an intermediate academic plan is the first step of the medium-range plan. Each academic area of a college first must formulate objectives in keeping with those of the institution. Although these plans are prepared individually, some degree of interaction between the two is necessary. The academic plans should indicate those courses that are being taught and those that will be added or dropped. This information then is used as a basis for estimating the amount of faculty, equipment, supplies and space required. The resulting projection of class offerings and projected requirements becomes the basis for more detailed budgeting.

The second step in this phase (Planning Support Programs) also starts with the formulation of goals and objectives by the support areas. These areas include all those activities necessary to support the primary functions of the institution (e.g., business office, student affairs, general administration.). Their goals and objectives must conform to those of the academic units as well as the institution as a whole and should serve as a basis for the preparation of a medium-range plan for the support areas.

Revenue Estimates

At this point, the cost of programs for the next five years is known. To see if revenue will be sufficient to cover these costs, future revenue

must be estimated. As already indicated, the chief determinant of revenue is enrollment, and enrollment projection will be discussed later in the chapter.

Government appropriations constitute a major portion of revenue for public institutions. Other sources of revenue include gifts, endowment earnings, and federal grants. These revenue sources are estimated after analyzing external factors (discussed in a previous section).

Budget Preparation

As the flowchart indicates, work on the third phase (Budget Preparation) should begin about eight months before the beginning of the fiscal year (the previous November). The first step in this phase requires that data for the coming year be extracted from the medium-range plan. This information is transferred onto special budget forms with supporting data. At this point it is examined closely and subjected to numerous revisions and final approval.

Although the procedures recommended here are relatively unsophisticated, they seem to represent important improvements over current practices since, generally, the current budget process consists of only the third phase. Results of this study indicate that the first two phases often are nonexistent or done by only one individual such as the president or business officer. The use of more sophisticated budgeting techniques, such as PPBS and Zero-Base Budgeting, will be discussed in the next chapter.

Management Information Systems

A Management Information System (MIS) involves the collection, storage and retrieval of information for planning and control purposes. Its main objective is to provide timely and meaningful data to assist in the management of an organization.

MIS is a vast area about which much has been written. The utilization of this technique will vary significantly from institution to institution depending upon circumstances and needs. This section contains a brief discussion of some of the characteristics of MIS as well as ways it might be developed by colleges and universities.

Characteristics of MIS

MIS assists management by providing it with relevant information for

decision purposes. The difficulty of defining this system comprehensively is indicated by the following:[5]

> MIS is not an easily definable or fixed system which occurs in the same form for all organizations; rather, it is a system which is constantly undergoing change and providing more, better, or diversified information, as may be required by the organization. There is not a specific point when a series of unrelated subsystems become a management information system. Perhaps more specifically, a management information system exists with the awareness and acceptance of the goals of the information being provided and the willingness, on the part of the decision makers, to coordinate all efforts toward that goal.

A true MIS should be based upon analysis of the information flow of all functional areas of an institution and upon a fully defined and integrated data base. In addition, the user should have the ability to retrieve data from the data base in such a way as to provide information for decision purposes in a timely manner.

MIS and Higher Education

Development of fully integrated management information systems at colleges or universities generally is not very advanced right now. In the interviews, however, many college administrators expressed an interest in developing or improving their system. Thus, the author decided to discuss briefly the applicability of MIS to higher education and indicate some sources from the literature which describe implementation techniques.

MIS draws information used in decision making from many different sources. In higher education these sources might fall into five areas: student, staff, facilities, financial, and curriculum data. Each of these areas is further divided into subsystems, all which might be supported by more than one data base. The data bases contain related elements that are not repeated in the other data bases.

As an example, a student information system, with a student registration subsystem, might draw information from five different data bases. The types of information collected and their sources would be:[6]

1. Course and section number from course data base.
2. Student biographical data from the student data base.
3. Teacher's name from the staff data base.
4. Building and room number from facilities data base.
5. Tuition and fee rates from the financial data base.

Much literature deals with MIS and higher education. In the report *A Management Information System for a Community College,*[7] an MIS for an institution of higher education is outlined. Although written for the community college, most of the procedures presented are applicable to all institutions of higher learning. In one article, L. Kornfield describes MIS developments at three universities.[8] He discusses the design, implementation, and costs and benefits of these systems.

Simulation Models

Research indicates that higher education's utilization of tools from the management sciences is growing. Management science has been identified as ". . . the use and interpretation of quantitative or qualitative data to assist in solving management problems."[9]

Cost simulation models are an important tool of the management scientist. This section will contain a nontechnical discussion of cost simulation models and their use in university management.

Components of a Simulation Model

A simulation model denotes the financial implications of a decision before that decision is implemented. Such a model relates how changes in one variable will effect changes in other variables. Thus, with the assistance of a computer, to ensure that resources will be used most effectively, a model can test the consequences of a number of complex alternatives. In effect, simulation makes it possible to operate a part of an institution "on paper."

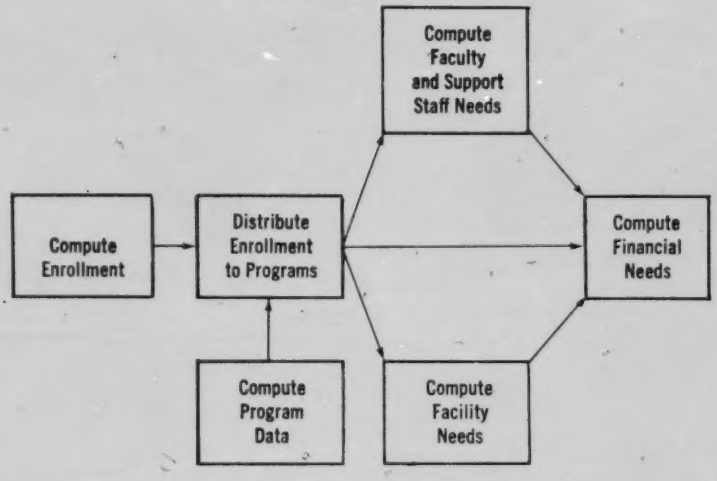
The major components of an institution of higher education are student enrollment, programs, faculty, facilities and finances. Exhibit 4-2 indicates the relationship among these components for an instructional department.

A simulation model for a college or university must include all of these components. Each should be represented by a module that incorporates variable relationships, expressed mathematically, which describe how changes in one variable produce changes in others. Quantitative data are required as input into each of the modules and should be detailed only to the extent required for planning decisions. As indicated in Exhibit 4-2, students and programs are the primary determinants of resource needs.

In the publication *"Cost Behavior Analysis for Planning in Higher*

EXHIBIT 4-2

Components of a Simulation Model



(Reprinted from Daniel D. Robinson et al., "Cost Behavior Analysis for Planning in Higher Education," *Professional File*, May 1977 p. 17, by permission of the National Association of College and University Business Officers.)

Education," it is recommended that the following types of information should be included in the appropriate modules:[10]

- *Students* — Enrollment by division, major and level, and average course load.
- *Programs* — Number of courses and sections by department and section sizes by department.
- *Faculty* — Number of teachers by rank and department and faculty work load.
- *Facilities* — Number of buildings, number and size of teaching stations, operating hours per day and facility utilization.
- *Finances* — Salaries, supply cost, and other expenditures, by department and revenues.

Information from the student module (enrollment and average course load) combined with section size by department, provided by the pro-

gram module, will help determine enrollment distribution and the number of sections required. With this information, as well as current faculty work load and facility policies, teacher and facility requirements can be determined. Finally, based on these inputs, the simulation model calculates financial needs.

Resource Allocation Models

As indicated, a number of participants of this study are utilizing simulation models to assist in the allocation of resources. The Resource Requirements Prediction Model (RRPM) was encountered several times in the study. The next section will contain a discussion of RRPM and a brief mention of other models in use.

RRPM

RRPM was developed by NCHEMS. Student enrollment is the primary input to the model, and two important ingredients of RRPM are the Student Flow Model and the Induced Course Load Matrix (ICLM). Resource requirements can be determined with input from these two sources and other parameters. Each of RRPM's two main ingredients and how the model is used to determine resource requirements will be discussed next.

Student Flow Model

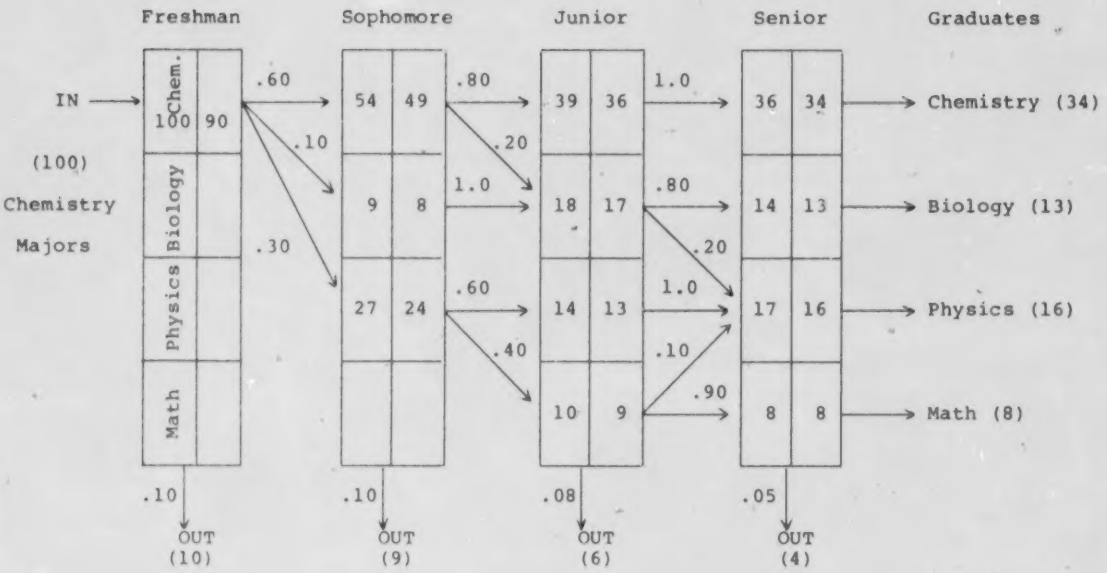
NCHEMS' Student Flow Model uses transitional probabilities to project the year-to-year flow of students between majors. Exhibit 4-3 illustrates the student flow concept.

In this illustration, 100 chemistry majors enter as freshmen. During the first year, 10% drop out of school, 60% continue in their sophomore year as chemistry majors, while 10% switch their major to biology and 30% to physics. This shifting process continues each year. At the end of four years, the original 100 chemistry majors are dispersed as follows:

Chemistry Graduates	34
Biology Graduates	13
Physics Graduates	16
Math Graduates	8
Dropouts	29
Total	100

EXHIBIT 4-3

Student Flow for Chemistry Majors



(Adapted from *Implementation of NCHEMS Planning and Management Tools at California State University, Fullerton*, p. 40.)

This concept provides a much more accurate picture of student enrollment than the usual methods which assume a static situation. Obviously, the predictive ability of the model depends on the accuracy of the transitional probabilities. Another advantage of this model is that it is extremely flexible. Besides providing enrollment forecasts, the student flow model can serve a number of other functions such as:

- To compare the attrition rate of different majors;
- To assess relative "holding power" among programs;
- To forecast trained manpower output from various programs;
- To examine the effect of changing admission policies.

EXHIBIT 4-4

Induced Course Load Matrix

Average Student Major

PROGRAMS

DEPARTMENTS	A	B	C	D
1	6.1	3.2	2.4	4.2
2	4.3	4.5	2.1	5.2
3	2.6	5.7	3.8	2.1
4	3.0	1.6	5.7	3.5
	16	15	14	15

(Adapted from *Implementation of NCHEMS Planning and Management Tools at California State University, Fullerton*, p. 58.)

Induced Course Load Matrix

A second major component of RRPM is the Induced Course Load Matrix. This matrix is a method for translating enrollment projections into student demand within different departments. ICLM yields the number of credit hours in each department taken by an average student enrolled in a particular program.

Exhibit 4-4 indicates that a typical Program A major, who takes 16 credit hours, will take an average of 6.1 credit hours in Department One, 4.3 credit hours in Department Two, 2.6 credit hours in Department Three, and 3.0 credit hours in Department Four. Thus, by multiplying each of these figures by the expected enrollment in Program A, one can determine the credit hour demand induced in each department.

Resource Requirements

Exhibit 4-5 assumes that 1,000 students are enrolled in each program and applies this enrollment to the matrix in Exhibit 4-4. As can be seen in this exhibit, the students in program A will take 6,100 credit hours in Department One, 4,300 credit hours in Department Two, and so on. By adding across, one can determine the total credit hours that must be produced by each department.

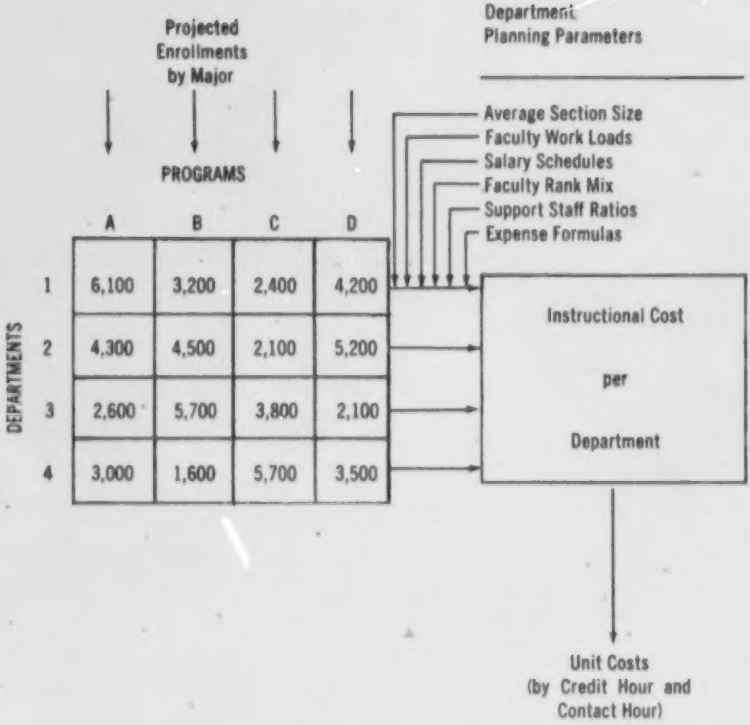
Various planning parameters (such as average section size, faculty work loads, salary schedules) then are applied to the projected enrollment to determine expected department costs. Total costs of a department then will be divided by the number of credit hours to determine unit costs per department. Finally, RRPM will distribute the department costs to degree programs in direct proportion to the number of credit hours drawn from each department by each degree program so that unit costs per program can be determined.

In addition to being used as a tool to allocate resources most effectively, RRPM can serve a number of other purposes. Among them are the following:

- In the determination and comparison of unit costs among institutions,
- To facilitate the preparation of a program budget,
- To assist in assessing the impact of alternative decisions,
- As an input to the evaluation of programs.

EXHIBIT 4-5

Resource Requirements



(Adapted from *Implementation of NCHEMS Planning and Management Tools at California State University, Fullerton*, p. 64.)

Other Comprehensive Models

In the course of study the author found a number of other comprehensive models in use at colleges and universities. They are similar to RRPM with some variations. The major ones are CAMPUS, SEARCH and PLANTRAN, plus a number of homemade variations. The participants who were utilizing these models experienced varying degrees of satisfaction.

CAMPUS (Computerized Analytical Methods in Planning University Systems) was introduced at the University of Toronto. Several versions of CAMPUS are available, including one time-sharing version which allows access from several institutions.

Peat, Marwick, Mitchell & Company has developed the simulation model SEARCH (System for Exploring Alternative Resource Commitments in Higher Education). SEARCH can operate in a time-sharing environment and is designed for use by smaller as well as larger institutions.

The Midwest Research Institute developed the model called PLANTRAN. The latest version, PLANTRAN II, is not a specific model; rather, it is a flexible tool with which an unlimited number of models can be constructed.

During the interview phase of this study, a number of institutions indicated that none of the above models was suitable for them because they were "unique" for a number of reasons (e.g., different mix of graduates vs. undergraduates, research vs. teaching, and the like). This reasoning often resulted in the continued use of less desirable and unsophisticated techniques. Some institutions, usually the very large ones, were involved in the development of their own "unique" model or complete information system. This development, often started from "scratch" probably resulted in duplications between institutions and was very expensive.

During this study, the author contacted the College and University Systems Exchange (CAUSE), located in Boulder, Colo., several times. CAUSE is a professional association dedicated to the use and advancement of information systems in higher education. In an attempt to make colleges and universities aware of what has been done in the field and thus reduce the duplication indicated above, it offers a number of services to its members. One of these services includes the maintenance of an exchange library, which has nearly 200 systems contributed by members. These systems, which are in operation at the contributing institution, are documented and available for loan.

Conclusion

Research indicates that there is a growing desire to improve the planning and budgeting processes in higher education. This chapter discussed a three-phase budget cycle, MIS, and simulation models and how they might improve these processes at colleges and universities.

NOTES

1. Ohio Board of Regents, *Planning—Universities*, Author, Columbus, Ohio, 1973, p. 18.

2. National Association of College and University Business Officers, *A College Planning Cycle: People, Resources, Process*, Author, Washington, D.C., 1975 p. 2.

3. *Ibid.*, p. 1.

4. Gerald B. Robins, *Understanding the College Budget*, Institute of Higher Education, University of Georgia, Athens, Ga., 1973.

5. Education Projects, Inc., *A Management Information System for a Community College, Author*, Pittsburgh, Pa., 1973, p. 2.

6. Robert L. Dan, "Management Data Base Development," *NACUBO Professional File*, July 1975, p. 2.

7. Educational Projects, Inc., *op. cit.*

8. Leo L. Kornfield, "Advanced Applied Management Information Systems in Higher Education: Three Case Studies," in *Management Information Systems: Their Development and Use in the Administration of Higher Education*, (John Minter and Ben Lawrence, eds.), WICHE, Boulder, Colo., 1969, pp. 85-93.

9. Roger G. Schroeder and Carl R. Adams, "The Effective Use of Management Science in University Administration," *Review of Educational Research*, Winter 1976, p. 118.

10. Daniel D. Robinson, et al., "Cost Behavior Analysis for Planning in Higher Education," *NACUBO Professional File*, May 1977, p. 16.

Chapter 5

PPBS and Zero-Base Budgeting

Several study participants stated that the traditional budget process in higher education is concerned primarily with dollar accountability. This study indicates that a Planning, Programming, Budgeting System and Zero-Base Budgeting are better suited for the management of a non-profit organization. In this chapter the author gives an overview of these two concepts as they might pertain to institutions of higher education.

Planning, Programming, Budgeting System

Planning, Programming, Budgeting System (PPBS), a relatively new concept in the field of higher education, was examined in depth in the course of this study. One question on the mail survey attempted to assess the usefulness of PPBS and examine implementation success or failure. In addition, a good portion of the interviews was spent discussing the concept.

This study's results disclosed that a large number of individual schools and statewide systems are committing a great deal of resources in an attempt to adopt some form of PPBS. Yet, many respondents, including some involved in PPBS implementation, freely admitted that they were not sure what PPBS was. Others indicated that they did not really understand how it could be used in higher education.

In almost all cases, it was discovered that attempts at implementation were facing serious obstacles. Because so many resources are being committed to the adoption of PPBS in higher education and because there seems to be a serious lack of understanding about it, this concept will be examined in some depth here. This section will discuss what is meant by the concept and present implementation suggestions for colleges and universities.

Definition

PPBS is not a new concept. Its major impetus came when it was adopted by the Department of Defense in 1961. In 1965 it was extended to other federal agencies, by executive order, and some form of it has been adopted by many state governments. Writers disagree as to how successful PPBS has been in the government sector.

PPBS is not an easy concept to define, and many adaptations of it exist, which tend to confuse an individual interested in understanding it better. Pure PPBS includes the two components, program budgeting and cost-benefit analysis. In higher education, however, PPBS seems to constitute program budgeting only, and the two terms (PPBS and program budgeting) are used interchangeably. The following section will discuss the concept of a program budget in higher education.

Program Budget

A program budget can be thought of as a budget that is constructed in such a fashion so that *resources* are allocated to *programs* in order to achieve certain predetermined or desired *outcomes.*

Resources indicate dollars necessary to provide services. They include costs of personnel, space, equipment, and the like. A *program* is a group of related activities necessary to achieve a specific goal or objective. In higher education, a program refers to those activities in which a group of students pursuing a common path must engage.

Outcomes, although a very elusive concept, are simply the products produced by a process. In higher education they generally are stated in terms of credit hours, headcounts, number of degrees granted, and so on. In reality, outcomes are much broader and are very difficult to measure. The concept of outcomes is discussed in Chapter 6.

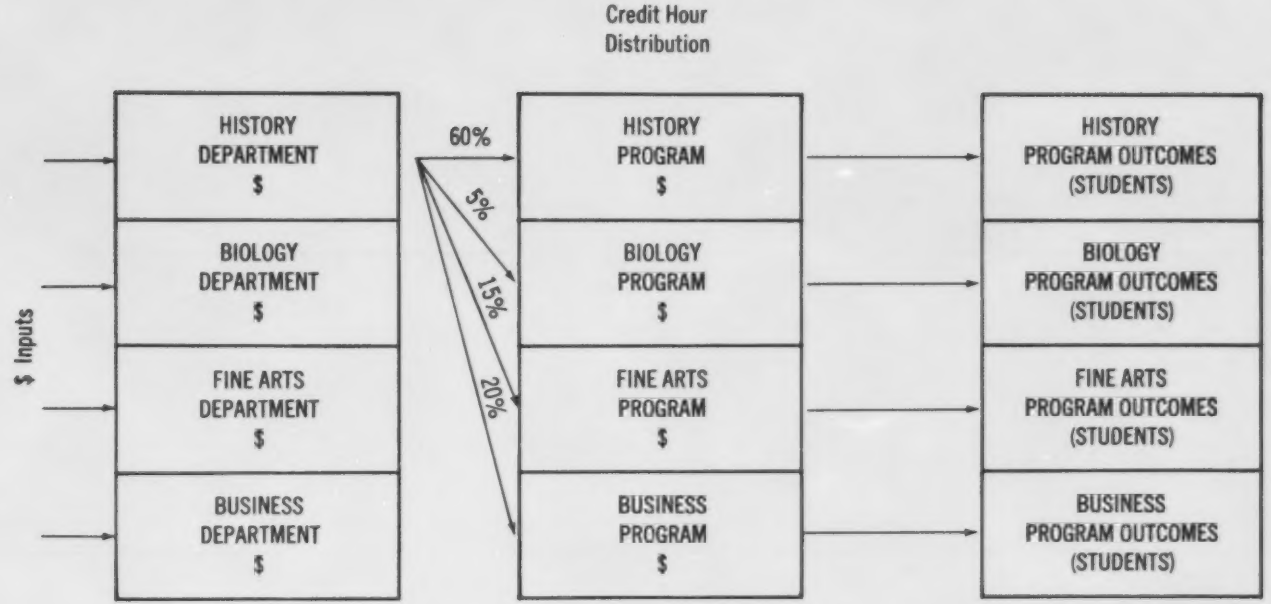
The translation of department costs into program costs is illustrated in the chart in Exhibit 5-1. This chart indicates that, based on the flow of credit hours to programs, 60% of the costs of the history department should be distributed to the history program. Likewise, 5% of its costs should be distributed to the biology program, 15% to fine arts, and 20% to the business program. Thus, the costs of each department are distributed to programs based on the instruction that department provides to students in different fields of study. The costs of each program then are related to outcomes (in this case, students).

Objectives and Characteristics of PPBS

The initial goal of PPBS is to integrate the planning and budgeting

EXHIBIT 5-1

Concept of a Program Budget



(Adapted from D. G. Clark and R. A. Huff, *Instructional Program Budgeting in Higher Education*, p. 4.)

function by organizing and presenting together the costs and benefits of various programs of an organization. Its principal objective is to facilitate the planning, management and allocation of resources among competing programs. D. R. Nichols states that, rather than being a well-defined system, PPBS is an approach to decision making and involves five main processes:[1]

1. The overall objectives and goals of the organization and the various agencies and departments within the organization are formulated. Priorities are determined for the attainment of the goals and objectives.
2. The possible alternative programs which may be used to fulfill the desired objectives are compared based on the effectiveness of each in achieving the organizational objectives.
3. The total cost of each program is related to the total benefits that would be derived from the program to determine the efficiency of the program.
4. The most effective and efficient programs are selected, integrated into a comprehensive program, and implemented.
5. The results of this program, once initiated, are reviewed and judged on the basis of its performance. The purposes of this review are control in the implementation of the program and procurement of information for future decisions and forecasts.

Thus, PPBS entails the definition of goals and objectives, the consideration of alternative programs to reach these goals and objectives, and the selection of the most effective alternative to achieve them. It is a goal-oriented system which attempts to quantify the decision process as much as possible.

Implementation Suggestions for a University

As already mentioned, the study results disclosed that attempts at implementing PPBS were facing serious obstacles. This section will present implementation suggestions for an institution of higher education. These implementation techniques will vary depending upon those portions of the system that are to be adopted, the unique characteristics of an institution, the availability of resources, and other such factors.

During 1971-1973, the Ohio Board of Regents directed a Management Improvement Program. As a result of this program, 10 manuals were published dealing with various aspects of the management of colleges and universities. One manual, *Program Budgeting: Two-Year Colleges*,[2] discusses seven steps required to develop a full PPBS. Although this manual is written primarily for two-year colleges, most of

the concepts discussed are relevant to four-year colleges as well. These seven steps are as follows:

1. Agree upon goals and objectives within the context of outputs.
2. Identify and plan on the basis of programs.
3. Calculate resource requirements of programs.
4. Compare resource requirements to available resources.
5. Allocate resource requirements.
6. Establish a system of program management.
7. Evaluate results with pre-established goals and objectives.

These steps will be discussed in the following sections.

Goals and Objectives

The first and one of the most difficult steps in developing a program budget is establishing goals and objectives in the context of outputs. Outputs are those products or services produced by a process.

A goal should be long term in nature and in agreement with the philosophy of the institution. It should be compatible with the aims and mission of the institution and be divisible into objectives. This study confirmed that college goals are described in very broad and vague terms. In order for goals to be most useful, they must be identified concisely and their attainment should be measurable or at least observable.

A number of techniques or instruments that have been developed can be used to assist in the development of goals, a complex process. Institutions might use these instruments as starting points and develop them further. One is an "Outline of the Inventory of Outcome Variables and Measures,"[3] developed by the National Center for Higher Education Management Systems (NCHEMS) and included as Appendix B to this report. Another is the *Institutional Goals Inventory*,[4] which lists 20 goal areas and divides them into two categories: outcome goals and process goals. They are :[5]

Outcome Goals

Academic Development
Intellectual Orientation
Individual Personal Development
Humanism/Altruism
Cultural/Aesthetic Awareness
Traditional Religiousness
Vocational Preparation
Advanced Training
Research

Outcome Goals

Meeting Local Needs
Public Service
Social Egalitarianism
Social Criticism/Activism

Process Goals

Freedom
Democratic Governance
Community
Intellectual/Aesthetic Environment
Innovation
Off-Campus Learning
Accountability/Efficiency

Both of these instruments will be discussed further in Chapter 6.

Program Classification Structure

The second step is to plan on the basis of programs. Traditionally, higher education has prepared a line-item budget, which focuses on the amount of resources required by each of the organizational units (e.g., departments). To develop PPBS, it therefore is necessary to reclassify these departmental costs into program costs.

Although a number of organizations have developed their own program classification structure, many utilize one developed by NCHEMS. NCHEMS' Program Classification Structure (PCS) is intended to provide a mechanism that will help an organization to assign costs on the basis of programs without restructuring its operational system. For the purposes of PCS, a program is considered a collection of resources, technologies and policies that serve a common objective and contribute to the achievement of an institutional objective.[6]

PCS groups programs into two major types: primary programs and support programs. The seven major programs, each divided into subprograms, are as follows:

Primary Programs

Instructional Program
Organized Research Program
Public Service Program

Support Programs

Academic Support Program
Student Service Program
Institutional Support Program
Independent Operations Program

The primary programs contain those activities related directly to the accomplishment of the primary objectives of the institution, while support programs contain those activities necessary for the successful operation of the primary programs. PCS support programs have been structured in such a way as to facilitate their allocation to the primary programs.

Resource Requirements

Steps 3, 4, and 5 for the development of PPBS deal with the calculation, comparison and allocation of resource requirements. When calculating resource requirements, one must consider both operating and capital budgets jointly since they both have a profound effect on each other. Techniques such as RRPM, that could be utilized in these calculations, were discussed in the previous chapter.

The comparison of required resources to available resources as well as the allocation of resources (steps 4 and 5) should be done on a program-by-program basis. While this is carried out, it would be desirable to establish priorities and consider alternatives. In the final allocation process, the benefits and costs of each program should be compared with the benefits and costs of other ways of utilizing the same resources.

Management and Evaluation

The last two steps are to establish a system of program management and to evaluate the results with pre-established goals and objectives. Program management includes the supervision, control and coordination of programs. This responsibility should be shared by both academic and non-academic administrators.

Evaluation of programs should be based on a comparison of actual results with pre-established objectives. This comparison of actual results with the goals of an institution is admittedly no easy task. It could be facilitated by a system of management by objectives (MBO), a discussion of which is contained in the next chapter.

Critical Gaps

Besides the fact that PPBS is costly and difficult to implement, it has

been unsuccessful because it contains a number of critical gaps, Peter A. Pyhrr suggests. These gaps are:[7]

1. PPBS focuses on what will be done, not how to do it.
2. Budgeting as defined by PPBS is a cost calculation based on the decisions made in the planning and programming steps (or long-range planning phase), whereas there are in reality many policy decisions and alternatives to be evaluated during the actual preparation.
3. PPBS does not provide an operating tool for the line managers who implement the policy and program decisions.
4. PPBS does not provide a mechanism to evaluate the impact of various funding levels on each program and program element or establish priorities among the programs and varying levels of program effort.
5. PPBS focuses primarily on new programs or major increases in ongoing programs and does not force the continual evaluation of ongoing activities and operations.

Pyhrr suggests that the concept of zero-base budgeting (ZBB), to be discussed in the next section, will fill these gaps and reinforce PPBS.

Zero-Base Budgeting

Although no college or university that participated in the interview phase of the project had experimented with ZBB, a few respondents to the questionnaire suggested that it would be a useful tool in the management of institutions of higher education. In addition, both the general literature and that relating to higher education strongly suggest that it is well suited for a nonprofit environment. Because this concept is relatively new, the author analyzes it in depth. Its actual implementation at a university also will be discussed in detail.

The first successful implementation of ZBB was at Texas Instruments Inc., in the early 1970's. The technique then was installed in the state of Georgia for the fiscal year 1973. Pyhrr was largely responsible for both these successful implementations and wrote the book, *Zero-Base Budgeting: A Practical Management Tool for Evaluating Expenses.* His concept subsequently has been adopted by a number of other profit and nonprofit organizations.

ZBB Explained

With ZBB, when a firm prepares its budget, it will "start from

scratch"[8] rather than using the current budget as a starting point. In the customary budgeting process, the tendency exists to accept the current budget as an established base and focus attention only on increases or decreases to it. Therefore only a small portion of the budget receives a critical review. However, under ZBB, all activities and priorities are viewed anew, and based on cost-benefit or similar analysis, a new set of allocations is provided for the coming year. Pyhrr feels that ZBB will improve the planning and decision-making process because:[9]

> With it, managers can reassess their operations from the ground up and justify every dollar spent in terms of current corporate goals. Instead of staying within the same budgetary structure year after year, they can make major reallocations of resources from one year to the next . . . (it) requires each organization to evaluate and review all its programs and activities (current as well as new) systematically, on the basis of output or performance as well as costs; to emphasize managerial decision making first and numbers-oriented budgets second; and to increase analysis of allocation alternatives.

The usual budgeting process generally tends to be numbers-oriented rather than decision-oriented since total dollars requested are identified rather than spending priorities. The process does not evaluate whether current programs are efficient and effective, nor does it attempt to determine whether certain programs should be reduced or eliminated so that a more profitable or higher-priority program might be funded, nor does it identify or rank these alternative programs. By reassessing operations from base zero, however, ZBB does accomplish all of these goals.

ZBB is most applicable to "actionable or discretionary" activities, programs or costs. "Actionable or discretionary" costs generally are costs of service and support activities. Although these costs almost always are a small portion of a budget, they usually are the most difficult to plan or control and offer the greatest level to affect profits.

Although most applicable to service and support activities, ZBB's potential uses are widespread. Pyhrr claims it is applicable to all ". . . activities, functions or operations where a cost/benefit relationship can be identified — even if this evaluation is highly subjective."[10]

The two basic steps necessary to establish ZBB are:[11]

1. Developing "decision packages." This step involves analyzing and describing each discrete activity — current as well as new, in one or more . . . packages.

2. Ranking "decision packages." This step involves evaluating and ranking these packages in order of importance through cost benefit analysis or subjective evaluation.

In his book, Pyhrr devotes considerable coverage to the explanation of these two steps and illustrates how they might be accomplished.

Decision Packages

A *decision unit* is a "meaningful element" of an organization which can be isolated for analysis and decision making.

Each organization must decide what its decision units should be. In many instances these units will correspond to a cost center or profit center of an organization. The *decision package* is a document which identifies and describes each decision unit in such a way that management can evaluate and rank it against other competing decision units and decide whether to approve or disapprove its funding.

The decision package must provide sufficient information so one may properly evaluate an activity. Thus this package must state the goals of the decision unit, how these goals are to be achieved, the expenditures required, the benefits expected, and the alternatives and consequences of rejecting the program.

The selection of alternatives requires the identification of alternative methods of accomplishing the objectives as well as the evaluation of different levels of effort in performing the operation. Once the best method of accomplishing an objective has been chosen from among different methods, alternative levels of effort and funding necessary to perform that operation must be identified (incremental decision packages).

Ranking Process

The ranking process provides management with a technique to allocate its resources by requiring that packages be evaluated and ranked either subjectively or by using cost-benefit analysis. Decision packages thus would be listed in order of decreasing benefit or importance. Such a priority listing should result in the best utilization of resources.

This ranking process can be extremely time-consuming in a large environment. Pyhrr discusses several methods of expediting this step. In one article he states that the ranking process would be simplified if managers:[12]

- Do not concentrate their time in ranking packages that are regarded as "high priorities" or as "requirements" and that are well within

the expenditure guidelines (other than to insure that all cost-reduction opportunities and operating improvements have been explored and followed through). Managers should concentrate their efforts instead on discretionary functions and the levels of effort required to achieve objectives.

- Do not spend too much time worrying whether package No. 4 is more important than package No. 5, but only assure themselves that packages Nos. 4 and 5 are more important than package No. 15, and package No. 15 is more important than package No. 25, and so on.

Reinforcing PPBS

There are many similarities between PPBS and ZBB. They both require that the budget process be conducted on the basis of programs or activities, both require that benefits be quantified, and both emphasize the use of cost-benefit analysis and other more sophisticated techniques.

There also are many differences between the two systems. For one thing, PPBS is basically a top-down approach, while the flow of data in ZBB is from lower to higher levels. In spite of any differences, the systems can be used to complement each other. Robert Anthony,[13] in an article that is highly critical of ZBB, contends that the use of "decision packages" could give renewed emphasis to PPBS.

Pyhrr claims that ZBB can be used to reinforce PPBS. He states that ZBB will fill in the critical gaps, discussed in a previous section, that are inherent in PPBS. He also maintains that the use of the two systems simultaneously will not necessarily produce duplication nor require an increase in staff. In fact, ZBB should reduce the work load of the PPBS staff who would be supplied with a great deal of information normally produced by them. ZBB involves an additional source, too—the line managers who are virtually ignored in PPBS.

ZBB in a University

The article "Zero-Base Budgeting in Action,"[14] by J. A. MacFarlane, discusses how McMaster University utilized ZBB. The university was facing financial difficulty and was confronted with the problem of having to make cutbacks of six percent without affecting quality. In the past, cutbacks generally were made across the board, but it was known that certain areas were better funded than others, so a six percent cutback would not affect the operation of some areas, while it seriously affected others.

Management decided that a process was needed whereby it could

distinguish between those areas and activities that were essential and had to be maintained and those areas that could be reduced or eliminated. In addition, the effects of any reduction or elimination on the operations of the total university had to be assessed before any action could be taken. Management felt that only if this could be done would the academic and research quality of the university not be impaired by such large cutbacks.

The university decided to apply the ZBB concept to the administrative and academic support activities within the university (i.e., business office, registrar, library, dean's office). Because duplications and inefficiencies were suspected in many of these areas, it was expected that savings would be achieved in one of two ways. First, since ZBB emphasized the examination of alternatives by line managers, it was expected that the managers would come up with less expensive alternatives. Second, if these savings were not sufficient, the ranking of decision packages would have to be made and lower-priority ones would have to be eliminated or reduced until the necessary savings were obtained. The method of establishing and ranking decision packages and the consequences of this program will be discussed in the following paragraphs.

Decision Packages

Decision packages, also referred to as components, were established for all support activities. Each component was fully described, indicating the component's objectives, functions, methods of operation, and other operational and/or legal considerations.

The business office, which typically would be treated as one entity, was broken down into different decision components for the sections dealing with accounts receivable, accounts payable, payroll, and so on. Although the description process generated a great deal of paperwork, it resulted in participants gaining insight into the actual workings of the various areas and improved the quality of subsequent decisions.

The identification of the current methods of operation also led to the discovery of a number of instances where functions were being duplicated. To determine how these duplications could be eliminated safely, each line manager was asked to identify the sources of inputs and the directions of their outputs.

Each manager was asked to identify the costs and benefits of each decision package in his area. Although determination of cost was relatively easy, the identification of the benefits was extremely difficult and usually qualitative in nature. An important step was to have managers explain the impact of reductions in their departments.

Managers also were asked to identify and evaluate alternatives for each activity outlined in a decision component. This process disclosed a number of cases in which the computerization of certain manual processes clearly was needed. In addition, areas where it would be cheaper to rent services rather than to provide them in-house were uncovered.

Ranking

The decision packages of a department then were reviewed by its managers, who ranked them according to their priorities as well as those of the university. The decision packages were then ranked by the next higher level of managers, who often changed priorities to reflect the needs of the university more appropriately.

The President's Budget Advisory Committee assisted in the final review process. This Committee was composed of the senior executive and financial officers and representatives of the academic staff and the student body. To insure that any resulting decisions to eliminate or reduce services would not harm the primary academic objectives, the deans of the faculty were added to this Committee.

A series of task forces was established to handle documentation and evaluation of the different areas under review. The task forces consisted of members of the Committee, the senior officer responsible for the unit under review, a senior officer not immediately responsible for the unit, and a dean of faculty.

The senior officer immediately in charge of the area under review had to explain and defend the operations of his unit. The officer not directly in charge reviewed the unit from the point of view of an outsider and thus more objectively. The dean of faculty and other members of the Committee offered insight as to what the impact would be on the primary academic goals of cutbacks in a specific area.

Before making any recommendations as to curtailments, eliminations or growth, these task forces spent a considerable amount of time in discussion among themselves and with line managers. Final recommendations were made to the Budget Advisory Committee, which consolidated and presented them to the president.

Consequences

As a result of the recommendations, the university was able to meet its budget objectives. Redundant staff positions were eliminated, and one full department was shut down. This department was given a low

performance rating, and its contribution to the university was deemed marginal. A number of functional areas were found to need improvement, and appropriate changes were made. The most important result of this process was that sufficient cost reductions were achieved, without having a negative effect on the primary function of teaching and research, so McMaster was no longer in financial difficulty.

Although this accomplishment required a great deal of time on the part of everyone involved, it was completed in 16 weeks. As a result, line managers developed a much tougher management approach and gained insight into the workings of the university. It was concluded that these developments were well worth the time consumed.

Conclusion

The study results indicate that PPBS and ZBB could make important contributions in the management of colleges and universities. Implementation of either of these systems is costly and time consuming, and without the full cooperation and commitment of top and lower levels of management, neither system can be successful. Furthermore, since they both rely heavily on benefits, some method of quantifying outcomes is required.

NOTES

1. Donald R. Nichols, "PPBS: A Challenge to Nonprofit Accounting," *Management Accounting*, November 1969, p. 12.
2. Ohio Board of Regents, *Program Budgeting: Two-Year Colleges*, Author, Columbus, Ohio, 1974.
3. Sidney S. Micek and Robert A. Wallhaus, *An Introduction to the Identification and Uses of Higher Education Outcome Information*, T.R. 40, NCHEMS, Boulder, Colo., 1973, pp. 39-41.
4. This instrument was developed by the Institutional Research Program for Higher Education, Educational Testing Service, New Jersey 08540.
5. *Goals for California Higher Education: Summary of a Report*, Education Testing Service, 1973, pp. 2-3.
6. Gordon Ziemer, et al., *Cost Finding Principles and Procedures*, Technical Report 26, NCHEMS, Boulder, Colo., 1971, p. 25.
7. Peter A. Pyhrr, *Zero-Base Budgeting: A Practical Management Tool for Evaluating Expenses*, John Wiley & Sons, New York, 1973, p. 149.
8. In practice, an organization usually starts at 70-80% of full activity level.
9. Peter A. Pyhrr, "Zero-Base Budgeting: Where to Use It and How to Begin," *S.A.M. Advanced Management Journal*, Summer 1976, pp. 5-6.

10. Peter A. Pyhrr, *Zero-Base Budgeting: A Practical . . ., op. cit.*, p. 19.

11. *Ibid.*, p. 5.

12. Peter A. Pyhrr, "Zero-Base Budgeting: Where . . .", *op. cit.* p. 19.

13. Robert N. Anthony, "Zero-Base Budgeting Is a Fraud," *The Wall Street Journal*, April 27, 1977.

14. John A. MacFarlane, "Zero-Base Budgeting In Action," *CA Magazine*, December 1976, pp. 28-32.

Chapter 6

Accountability in Higher Education

This study indicated clearly the need for higher education to increase its accountability to the public. A good portion of the interviews was devoted to examining how this might be done. Participants generally agreed that an important means of improving accountability and the management of colleges and universities would be for these institutions to make greater attempts to evaluate their performance. Preliminary to better performance evaluation is the need to develop reliable outcome measures. This chapter covers the meaning of accountability and the use of outcome measures and performance evaluation in higher education.

Applicability to Higher Education

Although the demands for increased accountability in higher education appear to be growing, no one knows exactly what this term means. In the introduction to *Evaluating Institutions for Accountability,* a collection of articles on the subject, editor Howard Bowen comments that the rise in the demand for accountability is caused by a frustration over rapidly increasing costs and a lack of confidence in our institutions. He further states that accountability:[1]

> . . . is closely related to such concepts as program budgeting, cost-benefit analysis, cost-effectiveness, and social indicators. It is the expression of a wish — felt by many public officials, donors, and the general public as well — that the increasing sums laid out for public services ought to be justified by reliable estimates of the outcomes.

Accountability is also referred to as:[2]

> . . . the obligation of institutions and their members to produce outcomes that are consistent with the goals of the institutions and that are demonstrably worth what they cost.

Thus, the present demand for accountability requires that colleges and universities demonstrate that they are providing promised results in an efficient and effective manner. Outcome measures, to be discussed in the following section, must be collected as evidence that these results are being achieved.

Outcome Measures

Outcomes can be thought of as the outputs or "products" of institutions of higher education. These outcomes are in the form of benefits to the individual and society, and because they are usually intangible, they are difficult to identify and measure. This section covers some serious problems disclosed by this study which are inherent in the identification and measurement of outcomes. This will be followed by a review of work done by NCHEMS in this area and some conceptual and surrogate outcome measures.

Problems of Identification and Measurement

There are a great many problems with the measurement of outcomes and considerable concern that their use, or misuse, might result in harm to an institution. As indicated, the collection of outcomes consistent with the goals of an institution is important to accountability, yet many participants doubted that such outcomes can be identified, let alone measured.

The educational process is complex and produces both multiple and joint outcomes which are highly intangible. They are interrelated complexly and valued differently by each audience. In addition, because the goals of colleges and universities generally are vague, it is difficult to translate these goals to specific outcomes.

As with the development of costing data, there is concern that outcome information will be misused and fear that the decision-making process will place more emphasis on those outputs that are more easily measurable. Thus, the decision maker will tend to focus on certain data because they are quantifiable, while ignoring more important outcomes or benefits simply because they are not quantifiable.

There also is concern that outcome measures cannot properly value the instruction, research and public service functions of higher education. Research and public service are extremely important functions of an institution and make substantial contributions to society. Because it is much more difficult to assess the impact of these functions, however, a tendency might exist to give them less importance. Obviously, in order to determine the outcomes of higher education accurately, all

three functions must be evaluated properly. This is a very real concern of large research institutions.

A related concern is that the benefits of certain goals that are unique to a specific institution will not be measured and evaluated properly, which could lead to poor decisions and encourage the demise of institutional diversity. Even if outcomes could be agreed upon, many people disagree as to how they should be measured or if it even is feasible to do so. For one thing, many outcomes are long-term in nature and may not be known for years.

It generally was agreed that more work must be done on the subject of outcome measures. Within the last few years, NCHEMS has been involved in an attempt to identify the outcomes of the educational process. Although many participants were familiar with this work, a good portion were not, so the next section covers NCHEMS' involvement in this area.

Work of NCHEMS

As part of the overall Information Exchange Program (IEP), NCHEMS is conducting an Outcomes Study. Its purpose, as is the purpose of the entire IEP, is to advance planning and management in higher education — to assist colleges and universities to develop outcome measures as well as standard procedures to assist in the collection of this information.

One of the first accomplishments of this project was the development of the "Inventory of Higher Education Outcome Variables and Measures."[3] A complete outline of this inventory is included in Appendix B. The inventory is divided into three main categories: Student Growth and Development; Development of New Knowledge and Art Forms; Community Development and Service.

Included in the inventory is a comprehensive list of the outcomes of higher education and suggested measures that might be used to determine them. For example, included in the first category, Student Growth and Development, is general knowledge. It is suggested that one of the means by which breadth of knowledge might be measured is by comparing the performance on tests of general knowledge at various points during an individual's education. Also included in this category is the outcome, leadership. It is suggested that one of several techniques that might be used to assess this outcome is to determine the average number of local, state and federal government positions held by students or graduates of an institution.

In 1974 NCHEMS mailed an extensive questionnaire to educational decision makers throughout the United States. The group included col-

lege presidents; top-level administrators for academic affairs, student affairs, and finance; state planners and legislators. The questionnaire contained a list of 112 outcome measures. The respondents were asked to indicate the extent that they needed to know each outcome measure for a decision-making purpose as well as whether this measure were available to them. A detailed description of the study and its results is contained in *The Higher Education Outcome Measures Identification Study: A Descriptive Summary*.[4]

Based on these two efforts, NCHEMS published *Outcome Measures and Procedures Manual*[5] which defines a wide range of outcome measures and which suggests procedures to collect the information needed for each measure. Most of these procedures are simple and rely primarily on the use of questionnaires or searches of institutional records. NCHEMS also recently published *A Handbook for Using the Student Outcomes Questionnaires*,[6] which will be discussed in the section on "Evaluative Instruments."

Conceptual Outcomes

A number of diverse outcomes of colleges and universities have been suggested in the literature and by various organizations, and some conceptual ones will be presented here. Howard Bowen suggests the following non-quantifiable outcomes for the three main functions of higher education:[7]

Services	Outcomes
Instruction	Learning and changes in human traits
Research and Scholarship	Preservation, discovery, and interpretation of knowledge, artistic and social criticism, philosophical reflection and advancement of the fine arts
Public Service	Varied benefits such as health, agricultural productivity, contributions to the solution of social problems

Although not as prolific as NCHEMS, the American College Testing Program also is involved in this area. In the preliminary phase of the College Outcome Measures Project (COMP), it developed six outcomes of general education and explained them as follows:[8]

I. *Communicating* — Can send and receive information in a variety of modes (written, graphic . . .) within a variety of settings (one-to-one, in small and large groups), and for a variety of purposes (for example, to inform, to understand. . .).

II. *Solving Problems* — Can analyze a variety of problems (for example, scientific, social, personal); select or create solutions to problems; and implement solutions.

III. *Clarifying Values* — Can identify one's personal values and the personal values of other individuals, understand how personal values develop, and analyze the implications of decisions made on the basis of personally held values.

IV. *Functioning within Social Institutions* — Can identify those activities and institutions which constitute the social aspects of a culture; . . . understand the impact that social institutions have on individuals in a culture; analyze one's own and others' personal functioning within social institutions.

V. *Using Science and Technology* — Can identify those activities and products which constitute the scientific/technological aspects of a culture (for example, transportation, housing. . .); understand the impact of such activities and products on the individuals and the physical environment in a culture; analyze the uses of technological products in a culture and one's personal use of such products.

VI. *Using Art* — Can identify those activities and products which constitute the artistic aspects of a culture (for example, graphic art, music . . .); understand the impact that art, in its various forms, has on individuals in a culture; analyze uses of works of art within a culture and one's personal use of art.

The scope of this project will be discussed further in the section on "Evaluative Instruments."

In the article "Measuring the Outcomes of Higher Education," Astin suggests a number of quantifiable measures for three conceptual outcomes.[9]

Conceptual Outcome	**Possible Outcome Measures**
Student's Critical Thinking Ability	Score on standardized multiple-choice test of critical thinking
	Grade on critical essay
	Ratings of critical thinking ability by job supervisor
Community Service	Number of faculty visits, lectures, etc. in local community
	Hours of student time devoted to community service projects
Faculty Productivity	Number of publications produced by faculty

Conceptual Outcome	Possible Outcome Measures
	Number of professional awards or honors received by faculty
	ACE ratings of departmental quality

The process of identifying and measuring conceptual outcomes is complex and requires a good deal of subjective judgment. As indicated, many participants fear that to use a measure simply because it is quantifiable would be misleading.

Surrogate Measures

This study confirms that institutions collect surrogate or substitute measures rather than trying to determine conceptual outcomes.

One of the most common methods used by a school to indicate output is in terms of the number of degrees granted. Participants, however, generally agreed that this is a poor measure because it does not consider the quality of education nor the difference in costs of various degrees. In addition, it ignores the contributions of research and public service.

Several other popular proxies encountered were input measures, such as the cost per student and the cost per degree. Participants agreed that the value of these input measures is highly questionable unless one makes the assumption that a direct relationship exists between these inputs and the outputs of the educational process.

Other frequently used measures are related to the achievement by graduates. They include the number of graduates who are accepted for advanced schooling, average income of graduates, and average score on the Graduate Record Examination. Participants generally indicated, however, that the success of a graduate is not an accurate measure of institutional impact unless initial ability is considered as well. Related to this point, one author made the following interesting comment:[10]

> If an institution takes from among the top one percent of the nation's secondary school graduates, it is pretty difficult not to turn out the top one percent of the nation's college graduates.

Other participants suggested an array of diverse quantifiable output measures that might be collected. John Keller suggests the following 14 proxy measures of the benefits of the institutional program:[11]

1. First offered wage;
2. Cumulative income (over 5, 10, 15 years);
3. Proportion into management level (by 5th or 10th year);

4. Number of papers published in scholarly or technical journals;
5. Rate of election to select professional groups or posts;
6. Proportion teaching in select schools;
7. Rate of award of civic and professional honors;
8. Proportion holding governmental posts of significant responsibility;
9. Proportion holding elective office;
10. Voting frequency;
11. Rate of participation in local civic affairs (fund drive chairmanship, Boy Scout leadership posts, etc.);
12. Drunkenness, arrest, and divorce rates;
13. Book and magazine reading frequency;
14. Personal evaluations of intellectual and social satisfaction.

The author further suggests that institutions should assign different weights to each of these measures in accordance with their own value systems.

A number of participants indicated that surrogate measures generally leave much to be desired and should be used with caution. This is particularly important if they are to be used in the internal decision-making process or for the justification of funds. It must be recognized that they are very rough indicators and thus should be used in conjunction with a good deal of judgment. In addition, participants feel that care should be exercised so too much emphasis is not placed on those outputs that are quantifiable, while those that are not are ignored.

Performance Evaluation

Performance evaluation is an integral part of accountability and the decision-making process. Evaluation in higher education has been described as ". . . a process of information gathering focused on the extent to which an educational program is achieving predetermined objectives."[12] Thus, it requires the establishment of specific goals and objectives and the development of criteria with which success in attaining them can be measured.

Evaluation in higher education might consist of the assessment of faculty, programs, or entire institutions among other things. The first part of this section will discuss the evaluation of faculty performance, and the second part illustrates various evaluative instruments which can be used by an institution.

Faculty Performance

Although the interviews and mail survey did not involve specific

techniques used in evaluating teaching performance, it became apparent that practice in performing this complex task varies significantly. In addition, participants indicated that there is a growing desire in higher education to evaluate the teaching performance of its faculty separately, largely to improve accountability.

When discussing the subject of faculty evaluation, many participants said that, if handled improperly, evaluation could result in great harm to higher education. Thus, institutions generally are moving slowly and cautiously in this area.

Because higher education is labor intensive, increased attempts to properly evaluate the performance of faculty are important to good management. As one author stated, "Good teaching cannot take place without good evaluation . . . evaluation helps produce better products. . . ."[13]

In this section the author will first present the results of another survey which analyzed in depth current practice in evaluating faculty performance. This will be followed by a discussion of a faculty evaluation system at one of the universities interviewed. Finally, the concept of management by objectives and its use at an institution of higher education will be presented.

Current Practices

In 1967 a survey was conducted for the American Council on Education (ACE) to determine current practices used to evaluate overall faculty performance and teaching performance. Questionnaires were sent to academic deans of business colleges accredited by the American Assembly of Collegiate Schools of Business (AACSB). In 1975, this study was duplicated by Peter Seldin[14] to identify major changes or trends. In 1967, 65 schools responded, while in 1975, 147 responded.

Exhibit 6-1 lists, in order of the 1975 ranking, the percentage of respondents who indicated an item as being a major factor in evaluating overall performance in the 1967 and 1975 studies.

As can be seen, almost all deans who responded included classroom teaching as a major factor in evaluating overall performance. Research and publication remain the second most dominant factors and have slightly increased in importance. Some significant changes have also taken place. The relative importance of public service has increased appreciably (from seventh place in 1967 to fourth in 1975). Meanwhile the importance of personal attributes has decreased significantly.

Exhibit 6-2 summarizes the types of information "always used" in evaluating teaching performance.

The results indicate that a number of changes have occurred. Although chairman and dean evaluations were cited most frequently, a big

drop was indicated in the use of colleagues' opinions (from 71.9% to 33.3%). On the other hand, the use of systematic student ratings has more than tripled; its ranking has moved from ninth place to third place.

Evaluation System at a University

A comprehensive faculty evaluation system, still in the process of development, is in use at one of the universities visited during the interview stage of the project. It will be discussed briefly here because it contains some interesting features.

The system attempts to evaluate overall performance by quantitatively measuring faculty performance in the areas of teaching, research, and professional activities and service.

Teaching effectiveness is measured by students as well as department

EXHIBIT 6-1

Major Factors in Evaluating Overall Performance

Factors	1967 (n=65) %	1967 (n=65) Rank	1975 (n=147) %	1975 (n=147) Rank
Classroom Teaching	95.3	1	99.3	1
Research	84.4	2	86.4	2
Publication	82.8	3	86.4	2
Public Service	29.7	7	36.1	4
Supervision of Graduate Study	38.7	5	24.7	5
Activity in Professional Societies	35.9	6	24.7	5
Student Advising	22.2	8	24.5	7
Length of Service in Rank	18.8	10	22.5	8
Campus Committee Work	21.9	9	20.4	9
Personal Attributes	50.0	4	16.3	10
Consultation (Government, Business)	6.4	13	8.9	11
Competing Job Offers	15.6	11	5.4	12
Supervision of Honors Program	10.3	12	1.4	13

(Summarized from Peter Seldin, "Current Practices in Evaluating the Business Faculty," *AACSB Bulletin*, April 1976, pp. 2 and 3.)

heads. Students evaluate the teaching competency of instructors by completing structured evaluation forms. Department heads assess professors by using a structured three-part evaluation. The first part deals with instructional contribution and measures classroom performance. The second part, counseling-advising, is concerned with the instructor's sensitivity to student needs. The third part, program contribution, evaluates activities not directly related to specific classes (e.g., course and curriculum development, and the like). Raw scores are developed for these two sets of evaluations, then converted into standard scores, and the two scores are combined.

Research productivity is evaluated by various weights being assigned to different types of research and publication. For example, the faculty

EXHIBIT 6-2

Information "Always Used" in Evaluating Teaching Performance

Types of Information	1967 (n=65) %	1967 (n=65) Rank	1975 (n=147) %	1975 (n=147) Rank
Chairman Evaluation	88.7	2	78.9	1
Dean Evaluation	89.1	1	76.2	2
Systematic Student Ratings	20.6	9	65.3	3
Scholarly Research and Publication	75.0	3	53.8	4
Committee Evaluation	30.0	6	47.6	5
Colleagues' Opinions	71.9	4	33.3	6
Self-Evaluation or Report	26.3	7	17.7	7
Informal Student Opinions	47.6	5	16.3	8
Course Syllabi and Examinations	22.6	8	10.2	9
Classroom Visits	5.2	14	4.1	10
Student Examination Performance	20.0	10	4.1	10
Grade Distributions	19.4	11	3.5	12
Long-Term Follow-Up of Students	1.6	15	2.1	13
Alumni Opinions	16.7	12	2.1	13
Enrollment in Elective Courses	14.8	13	0.7	15

(Summarized from Peter Seldin, "Current Practices in Evaluating the Business Faculty," *AACSB Bulletin*, April 1976, pp. 3 and 5.)

member who publishes a book is credited with 1,500 points, while the preparer of a book review earns 40 points. The same weighing procedure is followed for professional activities and services. For example, membership in a professional association activity is given five points, while membership on a national editorial board earns 50 points and a regional board 25 points.

Raw and standard score indices are developed for each faculty member. The current score, as well as the lifetime score, is accumulated and the results supplied to individual faculty members.

Although it was agreed that some problems have been encountered in applying this system, faculty reaction generally has been positive. It has led not only to increased accountability of the faculty but also to the improvement in the operations of the university.

Management by Objectives

Management by Objectives (MBO) can be used as an evaluation technique as well as an instrument for the planning and control of an organization. As indicated previously, MBO can be an important ingredient in a PPBS or ZBB system. In order for either of these budgeting concepts to be successful, it must be linked to the goals and objectives of the university. MBO is a technique by which members of an institution jointly identify goals and objectives and coordinate efforts to achieve them.

No participants in the interviews had a full MBO system although some had adopted portions of the concept. A number of participants felt that MBO was applicable to higher education and made suggestions as to how it could be used in colleges and universities.

Applied to a University

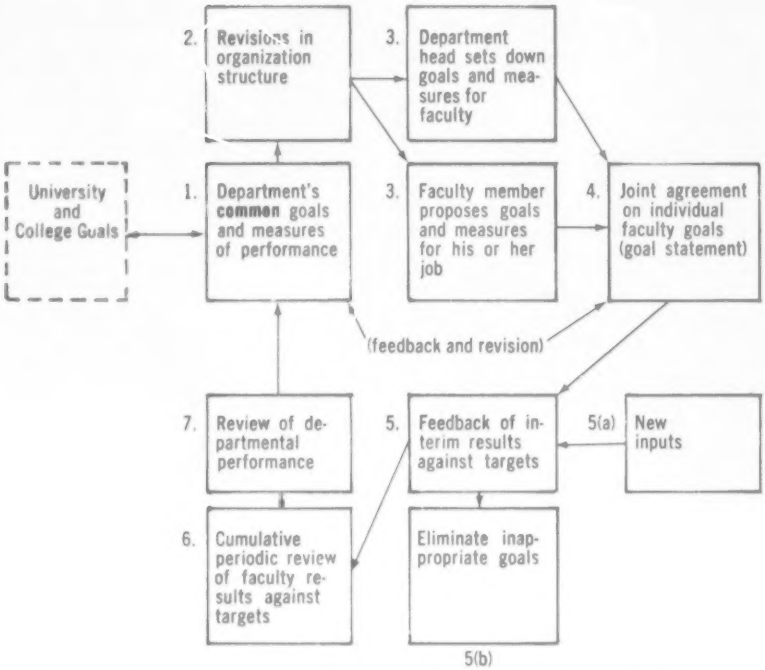
In the article "Management by Objectives in a University Environment," the authors describe four basic components of MBO:[15]

1. Establishing an agreement between the subordinate and the superior as to the former's objectives;
2. Developing action plans which will translate the objectives into work programs for the individuals;
3. Making periodic interim reviews of the employee's progress in attaining the objectives; and
4. Conducting formal appraisals during which the subordinate has an opportunity to . . . assess his actual accomplishments in relation to objectives established at the beginning of the period.

Exhibit 6-3 is a flowchart which illustrates the relationship of the major stages of MBO in an academic department.

EXHIBIT 6-3

The Cycle of Management by Objectives in an Academic Department


2. Revisions in organization structure
3. Department head sets down goals and measures for faculty
University and College Goals
1. Department's common goals and measures of performance
3. Faculty member proposes goals and measures for his or her job
4. Joint agreement on individual faculty goals (goal statement)
(feedback and revision)
7. Review of departmental performance
5. Feedback of interim results against targets
5(a) New inputs
6. Cumulative periodic review of faculty results against targets
Eliminate inappropriate goals
5(b)

(Based on David W. Cravens and John B. Ross, "Management by Objectives in a University Environment," *AACSB Bulletin*, April 1976, p. 14.)

The initial stage of the process is the determination of a department's goals and the means of measuring performance in conformity with the university's goals and objectives. As a result of this process, certain revisions might have to be made in an organization's structure.

In the next stage, each faculty member and the department heads jointly will develop the goals for that faculty member for the coming year. This should result in a Faculty MBO Goal Statement, which is an integral part of the MBO process. In order for this statement to be most useful, it must indicate specific plans and objectives and continually should be revised and subject to change. An example of such a statement is included in Appendix C. Finally, the performance of each faculty member and the department as a whole should be reviewed on an interim basis.

MBO is a complex and time-consuming system. In order to be successful, it must have the full support of all levels of management. Like other techniques discussed in this report, MBO must be installed carefully so that it does not infringe upon academic freedom. If employed properly, MBO should not only lead to better management of an institution, but also to increased accountability of its faculty.

Evaluative Instruments

Although the interviews disclosed very few evaluative instruments in use at colleges and universities, the expanded literature search uncovered many such instruments. These instruments could be used to varying degrees to assess the effectiveness of the higher educational process.

Evaluation of Institutions of Postsecondary Education: An Annotated List of Instruments[16] is an excellent guide to some of the many instruments in existence. Published by the Council of Postsecondary Accreditation, it was prepared as a result of an attempt to focus attention on the need for more effective assessment of outcomes. It contains a description of available tests and other evaluative instruments which might be used in measuring outcomes.

The Center for Research and Development in Higher Education at Berkeley was engaged in a project to collect information dealing with the evaluation of innovative programs in higher education. As a result, it published *Improving and Assessing Performance: Evaluation in Higher Education*[17] and *A Manual for the Evaluation of Innovative Programs and Practices in Higher Education.*[18] Although most of the concepts and instruments discussed there deal with evaluation of innovative programs, many are applicable to all areas of higher education. These publications describe a wide range of evaluative instruments designed to evaluate both cognitive and noncognitive outcomes.

Next is a brief description of some other evaluative instruments the author encountered in the literature. They are not included in any of the above publications, and some are still in the developmental stage. Most of the instruments discussed here can be used to assist in the management of various areas of colleges and universities.

PERC

Program Effectiveness and Related Costs (PERC) is designed to relate program costs to the educational effectiveness of the program. PERC contains five interrelated components: outcomes, costs, students, faculty, and learning programs.

Student learning is at the center of PERC evaluations. Student outcomes of learning are assessed by use of "chains of evidence," and are gathered over an extended period of time, and are measured by use of multiple methods, observers and standards. PERC utilizes a longitudinal design to assess student learning, which is illustrated in Exhibit 6-4.

PERC is designed to follow the same group of students over time and incorporates standardized tests and questionnaires. It is supplemented and reinforced by case-study techniques. Thus, PERC attempts to identify cognitive and noncognitive student changes and when they occur. An excellent overview of PERC is contained in the article "Improving Student Outcomes and Institutional Decision-Making with PERC."[19]

NCHEMS' Handbook

The work of NCHEMS in the outcomes area was discussed in a previous section. NCHEMS recently published *A Handbook for Using the Student Outcomes Questionnaires*,[20] designed to assist in the collection of data concerning the outcomes of students at five major points:

- Upon entrance
- At some intermediate point
- Upon completion of degree
- Post-graduation
- After leaving the institution

The handbook contains already-prepared instruments which can be used to assess student progress and change at these points. It also contains separate instruments for use by community colleges.

HELIX

HELIX is designed for the moderate-size college and attempts to

EXHIBIT 6-4

PERC Longitudinal Design

Progress of Student	Survey and Standardized Test Technique	Case Study Techniques
POST GRADUATION	Graduate Follow-Up Questionnaire	Student Interviews
GRADUATION	Program Completion Questionnaire	Student and Faculty Interviews and Rating Forms
	Standardized Tests	
DURING STUDIES	Attrition Questionnaire	Content Analysis
	Faculty Questionnaire	Student and Faculty Interviews and Rating Forms
DEGREE PROGRAM APPROVAL	Student Experience Questionnaire	Content Analysis, Student and Faculty Interviews, and Rating Forms
	Student Biographical Inventory	Student Interviews
ENTRY	Standardized Test	Student and Faculty Rating Forms

(From E. G. Palola and T. Lehmann, "Improving Student Outcomes and Institutional Decision-Making with PERC," in O.T. Lenning (ed.), *New Directions for Higher Education: Improving Educational Outcomes*, Winter 1976, p. 80.)

link goals and outcomes to management and planning in higher education. This program, currently in the pilot stage, is composed of three principal instruments:

- Institutional Goals Inventory (IGI)
- CRE Advanced Tests and Undergraduate Program Tests (GRE/UP)
- The Higher Education Planning System (HEPS II)

The first two instruments were developed by the Educational Testing Service. IGI is designed to help colleges and universities develop and define goals that will be used as a basis for management decisions. This instrument lists 20 goal areas and was illustrated in Chapter 5. GRE/UP consists of achievement tests which are designed to measure outcomes of student learning in various major fields.

The third instrument, HEPS II, was developed by the Education & Economic Systems, Inc. It produces three computerized planning and management reports: assessment reports, budgeting reports, and simulation reports. The linking of these reports should improve institutional planning and evaluation.

COMP

College Outcome Measures Project (COMP) was organized by the American College Testing Program and is in the early pilot stage. It is anticipated that one of the results of this project will be the development of an assessment package which can be used to measure the more generic educational outcomes.

COMP should yield a cost-effective assessment package composed of modules, which permits institutions to use those portions they consider relevant. The resulting standardized assessment instruments and procedures should be able to be used in making comparisons between programs and institutions without inducing conformity. The general educational outcomes already developed in this project were discussed in a previous section.

Conclusion

This study investigated how an institution of higher education could increase its accountability and concluded that it could be done by developing better outcome measures and performance evaluation techniques. This chapter discussed various ways that improvements in these areas could be accomplished.

NOTES

1. Howard R. Bowen (ed.), *Evaluating Institutions for Accountability*, New Directions for Institutional Research, Jossey-Bass, Inc., San Francisco, Spring, 1974, p. XI.
2. *Ibid.*, p. 119.
3. Contained in appendix to Sidney S. Micek and Robert A. Wallhaus, *An Introduction to the Identification and Uses of Higher Education Outcome Information*, T.R. 40, NCHEMS, Boulder, Colo., 1973, pp. 39-66.
4. Sidney S. Micek and William R. Arney, *The Higher Education Outcome Measures Identification Study: A Descriptive Summary*, NCHEMS, Boulder, Colo., 1974.
5. Sidney S. Micek, et al., *Outcome Measures and Procedures Manual*, T.R. 70, NCHEMS, Boulder, Colo., 1975.
6. Cathleen Bower and Nancy K. Renkiewicz, *A Handbook for Using the Student Outcomes Questionnaires*, NCHEMS, Boulder, Colo., 1977.
7. Howard R. Bowen, *op. cit.*, pp. 2-3.
8. The American College Testing Program, "College Outcome Measures Report," Progress Report, March 1977.
9. Alexander W. Astin, "Measuring the Outcomes of Higher Education," in *Evaluating Institutions. . . .*, p. 27.
10. John Keller, "Higher Education Objectives: Measures of Performance and Effectiveness," in *Management Information Systems: Their Development and Use in the Administration of Higher Education*, (John Minter and Ben Lawrence, eds.) WICHE, Boulder, Colo., 1969, p. 79.
11. *Ibid.*, p. 81.
12. Richard E. Peterson, *The Crisis of Purpose: Definition and Uses of Institutional Goals*, ERIC Clearinghouse on Higher Education, Washington, D.C., reprinted by The George Washington University, 1971, p. 5.
13. Harold L. Hodgkinson, et al., *Improving and Assessing Performance: Evaluation in Higher Education*, Center for Research and Development in Higher Education, University of California, Berkeley, 1975, p. 191.
14. Peter Seldin, "Current Practices in Evaluating the Business Faculty," *AACSB Bulletin*, April 1976, pp. 1-6.
15. David W. Cravens and John B. Ross, "Management by Objectives in a University Environment," *AACSB Bulletin*, April 1976, p. 13.
16. Council of Postsecondary Accreditation, *Evaluation of Institutions of Postsecondary Education: An Annotated List of Instruments*, Washington, D.C., 1975.
17. Harold L. Hodgkinson, et al., *op cit.*
18. Harold L. Hodgkinson, et al., *A Manual for the Evaluation of Innovative Programs and Practices in Higher Education*, Center for Research and Development in Higher Education, University of California, Berkeley, 1974.
19. Ernest G. Palola and Timothy Lehmann, "Improving Student Outcomes and Institutional Decision-Making with PERC," in *Improving Educational Outcomes*, (Oscar Lenning, ed.), Jossey Bass, Inc., San Francisco, Winter 1976, pp. 73-92.
20. Cathleen Bower and Nancy K. Renkiewicz, *op. cit.*

Appendix A

Costing Standards

Costing Standard #1

THE PURPOSES FOR WHICH COST INFORMATION IS TO BE USED SHOULD DETERMINE THE FRAMEWORK WITHIN WHICH COST INFORMATION IS DEVELOPED.

Costs are determined to satisfy specific purposes for which cost information is needed. A clear definition of these purposes is needed in order to specify the cost determination approach to be used.

Costing Standard #2

COST INFORMATION SHOULD BE BASED ON THE ACCRUAL METHOD OF ACCOUNTING.

Two methods of determining cost are the cash basis method and the accrual basis method. The cash basis method of accounting recognizes expenditures when cash is paid, whereas accrual accounting recognizes expenditures when materials are used and services are performed. To provide valid and consistent cost, the accrual method of accounting should be used, applying the concept of materiality.

Costing Standard #3

COST DATA SHOULD BE RECONCILABLE TO OFFICIAL FINANCIAL ACCOUNTING DATA.

Reconciliation to official financial accounting records is necessary to insure the validity of cost records. (Reconciliation is the process of identifying and giving appropriate consideration to differences in two or more sets of data.)

Costing Standard #4

NONFINANCIAL DATA SHOULD BE RECONCILABLE TO OFFICIAL INSTITUTIONAL RECORDS.

Reconciliation of nonfinancial data to the official records of the institution is necessary to insure the validity of cost data when such nonfinancial data are used in the cost determination process. (Reconciliation is the process of identifying and giving appropriate consideration to differences in two or more sets of data.)

Costing Standard #5

DEFINITIONS USED IN COST DETERMINATIONS SHOULD BE APPLIED UNIFORMLY.

Uniform definitions should be employed during the cost determination process and from period to period to achieve reliable cost information.

Costing Standard #6

COST INFORMATION AND RELATED COSTING UNITS SHOULD COVER THE SAME PERIOD.

Cost determination for a particular period should be related to the units of service provided during the same period.

Costing Standard #7

COST INFORMATION SHOULD BE CONSISTENTLY DETERMINED.

Cost information used in any cost study must be consistently determined for all periods included and for all organizational units included. Cost data will not be comparable unless consistently determined. Consistency depends on uniform definitions, methods, and interpretations as well as judgments exercised in the cost determination process.

Costing Standard #8

COST SHOULD BE ATTRIBUTED TO A COST OBJECTIVE BASED ON A CAUSAL OR BENEFICIAL RELATIONSHIP.

Meaningful and dependable cost determinations require that costs be assigned to cost objectives according to identifiable relationships that logically and reasonably cause the cost to occur or that result in benefits received by the cost objective.

Costing Standard #9

INDIRECT COST SHOULD BE ALLOCATED BASED ON QUANTITATIVE MEASURES THAT CAN BE APPLIED IN A PRACTICAL MANNER.

The bases of allocation of indirect cost should involve the use of those quantitative measures which best represent the relationship of cost to the cost objective, with the result that indirect costs are equitably distributed. There are instances when the most equitable distribution may not be the most practical, both in terms of time and related expense involved in collecting and tabulating quantitative measures. In such cases, the most practical measure should be selected, provided the results are not materially different.

Costing Standard #10

COMMON COST INCURRED TO PROVIDE TWO OR MORE SERVICES SHOULD BE ALLOCATED IN AN EQUITABLE MANNER.

Allocation of common costs to joint services, which are cost objectives, should be based on a logical relationship of the several services to one another and to the nature and circumstances of the costs incurred. It should be recognized that separate costing of jointly produced services is subjective and the bases available to allocate joint costs are arbitrary.

Costing Standard #11

CAPITAL COST OF A COST OBJECTIVE SHOULD REFLECT THE APPLICABLE EXPIRED CAPITAL COST OF THE PERIOD.

Capital cost of a cost objective should reflect applicable expired cost determined on the basis of the estimated useful life of the asset being depreciated.

Costing Standard #12

COST INFORMATION SHOULD BE ACCOMPANIED BY A DISCLOSURE STATEMENT.

Explanatory disclosures necessary to provide the user with a clear understanding of the previously established, intended use of cost information should accompany the reporting of such information. Disclosures should encompass the costing method and approach used, the cost definition used, the types of cost included, identification of cost objectives and costing units, and other information pertinent to the cost determination effort.

(Reprinted from "Fundamental Considerations for Determining Cost Information in Higher Education" (Chapter 4:5 of *Administrative Service*, pp. 15-16), by permission of the National Association of College and University Business Officers.)

Appendix B

Outline of the Inventory of Higher Education Outcome Variables and Measures

1.0 Student Growth and Development
- 1.1.0 Knowledge and Skills Development
  - 1.1.1.00 Knowledge Development
    - 1.1.1.01 General Knowledge
    - 1.1.1.02 Specialized Knowledge
  - 1.1.2.00 Skills Development
    - 1.1.2.01 Application of Knowledge Skills
    - 1.1.2.02 Critical Thinking and Reasoning Skills
    - 1.1.2.03 Creativity Skills
    - 1.1.2.04 Communication Skills
    - 1.1.2.05 Motor Skills
  - 1.1.3.00 Knowledge and Skills Attitudes, Values, and Beliefs
    - 1.1.3.01 Intellectual Disposition

- 1.2.0 Social Development
  - 1.2.1.00 Social Skills
    - 1.2.1.01 Interpersonal Participation
    - 1.2.1.02 Leadership
    - 1.2.1.03 Citizenship
  - 1.2.2.00 Social Attitudes, Values, and Beliefs
    - 1.2.2.01 Political
    - 1.2.2.02 Racial/Ethnic
    - 1.2.2.03 Personal Ethics
    - 1.2.2.04 Social Conscience
    - 1.2.2.05 Socio-Economic Aspirations
    - 1.2.2.06 Cultural Interest

1.3.0 Personal Development
1.3.1.00 Student Health
1.3.1.01 Physical Health
1.3.1.02 Mental Health
1.3.2.00 Student Personal Attitudes, Values, and Beliefs
1.3.2.01 Religious and Spiritual
1.3.2.02 Change/Stability
1.3.2.03 Self-Concept

1.4.0 Career Development
1.4.1.00 Career Preparation
1.4.1.01 Academic Preparation
1.4.1.02 Vocational Preparation
1.4.2.00 Career Attitudes, Values, and Beliefs
1.4.2.01 Achievement Orientation
1.4.2.02 Educational Aspirations
1.4.2.03 Educational Satisfaction
1.4.2.04 Vocational Aspirations

2.0 Development of New Knowledge and Art Forms
2.0.0.01 Discovery of New Knowledge
2.0.0.02 Interpretation and Application of New Knowledge
2.0.0.03 Reorganization of New Knowledge

3.0 Community Development and Service
3.1.0 Community Development
3.1.0.01 Community Educational Development
3.1.0.02 Faculty/Staff Educational Development

3.2.0 Community Service
3.2.0.01 Extension Services
3.2.0.02 Personal Services
3.2.0.03 Extramural Cultural and Recreational Services
3.2.0.04 Financial Impact on the Community

3.3.0 Longer Term Community Effects
3.3.0.01 Social Impact
3.3.0.02 Economic Impact

(From Sidney S. Micek, Robert A. Wallhaus, *An Introduction to the Identification and Uses of Higher Education Outcome Information*, pp. 39-41.)

Appendix C

Illustration of a Faculty MBO Statement: Objectives and Plans for the Academic Year

I. MAJOR OBJECTIVE AREAS AND TIME ALLOCATION
   A. Teaching — 50% of total work time (nine hours per quarter).
   B. Research and Writing — 35% of total work time.
   C. Public Service and Administration — 15% of total work time.

II. TEACHING
   A. Topic Framework and Schemes
      1. In rough draft form: market opportunity analysis, product decisions, and advertising decisions.
      2. In process of development: decision-making concepts and models.
      3. Scheduled: buyer behavior, pricing decisions, marketing channels and systems.

   B. Visual Aids
      1. Visual aids will be developed to accompany the above frameworks and schemes for classroom use (5200, 4210, 5350).
      2. Visual aids will be developed to accompany lectures in the 3120 large section to be taught in the spring.

   C. Revision of the Buyer Behavior Course
      1. Revision of the 4210 course to incorporate more applications and integrate applications and theory.
         a. Completed about ⅓ of this revision as of December 1972.
         b. Revise another ⅓ during the winter quarter, and the final ⅓ in the spring quarter.
      2. Currently developing an approach to the graduate buyer behavior course for winter.

D. Coordination of the Housing Partnership Project (with two professors)
   1. Helped develop the overall plan for integrating this project into the graduate research — buyer behavior — strategy course sequence (fall).
   2. Participated in the supervision of the questionnaire design portion of the project (5300 task — fall).
   3. Coordinate data analysis portion of project (5350 task — winter).
   4. Participate in the evaluation of the recommended strategy report to management (5410 task — spring).

E. Serving as a member of a Dissertation Committee.

III. RESEARCH AND WRITING

A. Shopping Mall Projects
   1. The first wave of questionnaires has been returned and coded.
   2 Analysis of the first wave data is now beginning and will continue through the winter quarter.
   3. The design of the second wave of questionnaires is now under way and it should go out in January-February.
   4. Spring and summer quarters at a minimum will be devoted to analysis of first and second wave data and preparing the third wave questionnaire.

B. Marketing Management Text
   1. Preparation (literature review and outline) is now being completed for chapter on decision making.
   2. Schedule of a chapter every two months is now contemplated.

C. Appalachian Consumer Study
   1. Agreed to work with another professor on this project.
   2. Time to be committed and schedule of activities is unknown at this time.

D. New Research
   1. Working on the design of a follow-up study to my dissertation that will center on testing validity and realiability of consumer prior information measurement procedures.
   2. Intend to develop and submit a proposal for funding by capital gifts funds for the next academic year.

IV. PUBLIC SERVICE

A. Consulting

1. Time for consulting during the year is quite limited (no more than 1-2 days per month).
2. Projects at this time cannot be forecasted but intend to stay within the above limit.

B. Other

1. Will also support other activities on a very limited basis as they develop.
2. Would hope these activities would involve no more than 3-4 days during the year.

V. ADMINISTRATIVE ACTIVITIES

A. College-Wide Activities

1. Member of the DBA Committee and will devote time as called upon to do so.
2. As a new member, cannot forecast time to be committed on activities.

B. Departmental Activities

1. Coordination of public relations activities.
2. Coordination of MBA examinations.

C. Other — Serving as a member of the Association for Consumer Research Membership Committee.

(From David W. Cravens and John B. Ross, "Management by Objectives in a University Environment," *AACSB Bulletin*, April 1976, p. 17.)

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